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A SYSTEMATIC STUDY OF THE CHALCIDID GENUS *UGA* GIRAULT (HYMENOPTERA : CHALCIDOIDEA), PARASITES OF EPILACHNINE BEETLES

By G. J. Kerrich

(*Commonwealth Institute of Entomology, c/o British Museum (Natural History), London, S.W.7*)

A species of Chalcididae *s. str.* was submitted for determination in 1953 by Dr. S. G. Sen Gupta, State Entomologist of Orissa. It is a parasite of larvae of *Epilachna* species (leaf-eating Coccinellidae) and is of economic importance in Orissa in that it practically causes the disappearance of the *Epilachna* in some seasons. Consequently, it was desired that a name should be made available for it.

The species was thought at first to belong to an undescribed genus, but was later placed by Mr. E. F. Riek as a species of *Uga* Girault, a genus known only from Australia. Mr. Riek very kindly enabled the author to see material of the Australian species, *U. colliscutellum* (Grlt.). Three other species are available and, together with the Indian, are described as new. All five species have been reared from larvae of *Epilachna*. The adult insects may be retiring in their habits, for no species of this distinctive genus is known to the author from net-caught material.

Uga Girault, 1930

Girault, 1930, *New Pests from Australia* **8** : 4 (Brisbane, 16th Aug., privately printed).

Diagnosis and Systematic Position

There is doubt as to whether the genera and species proposed by Girault in his privately printed papers are validly published except in so far as they have been taken up since. The above name is accepted in consideration of Mr. Riek's determination, and the generic determination of the Indian species was supplied to Dr. Sen Gupta in 1955.

The genus *Uga* belongs in the Haltichellinae, within which it is related to *Hockeria* Walker. It is immediately distinguished from all other members of the subfamily by the very strongly raised scutellum, which is subpyramidally or semicircularly arched (figs. 11–12). Other characters separating it from *Hockeria* are : inter-ocellar protuberances present, very weak to very strong (figs. 2, 4–6, 12) ; insertions of antennae a little higher, not directly above clypeus (fig. 4) ; pedicellus of female considerably shorter, about one and a half times as long as broad (fig. 7) ; axillulae in Asiatic and Australian species densely silvery-pilose (figs. 9–10) ; gaster of female with first large tergite more than half its total length dorsally (fig. 12) (rarely so in *Hockeria*) ; fore wing with postmarginal vein not reaching beyond tip of uncus (in *Hockeria* always reaching beyond tip of uncus, often very distinctly so).

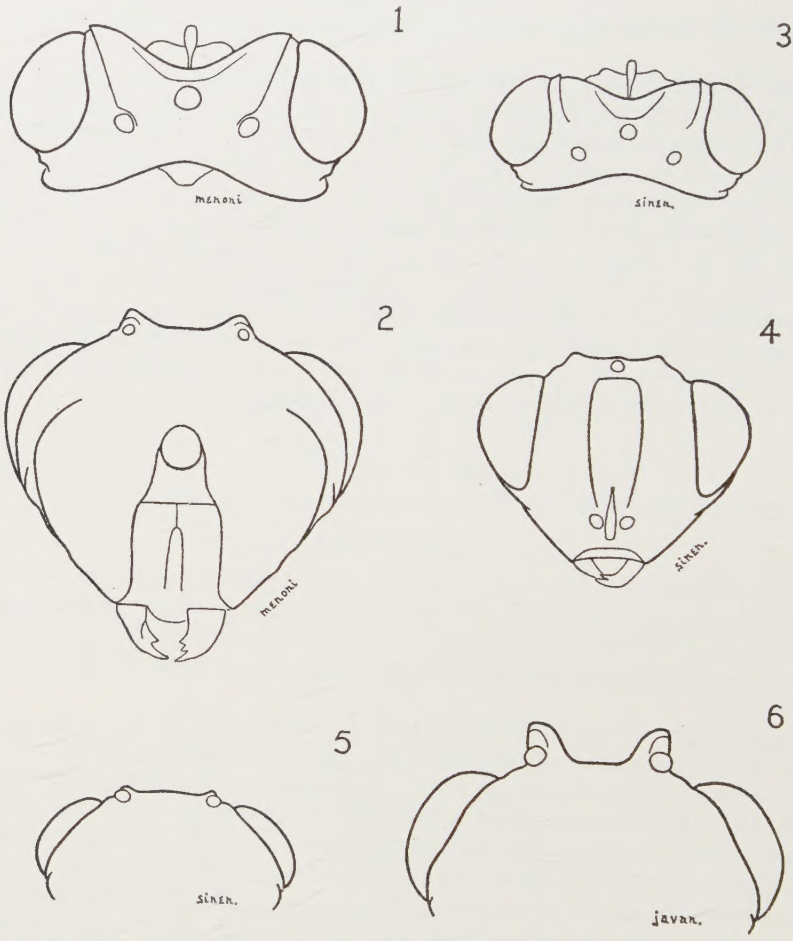
Characters of the Genus Uga *Girault* (see fig. 12)

Head for the most part, thorax above, mesopleura before and behind acetabula, and sides of propodeum coarsely and rather regularly reticulate-punctate, the punctures piliferous and the raised reticulations bearing fine microsculpture.

Head, seen from above, moderately to very deeply emarginate anteriorly and moderately to very strongly narrowed behind eyes (figs. 1 and 3) ; having a pair of inter-ocellar protuberances which are very weak to strong (figs. 2, 4–6). Preorbital keels distinct and more or less sharp but not strong ; malar-postorbital keel more or less developed. Eyes very finely and sparsely hairy, the hairs difficult to discern. Toruli not far above clypeus (fig. 4), in male a little higher.

Inter-antennal plate polished in front, in Asiatic and Australian species rather thick (figs 1, 3–4), but in all produced into a much finer carina above. Scrobal impression more than one-third width of face, almost reaching median ocellus (fig. 4), more or less shining, transversely striate-reticulate, the striations generally much stronger beside the inter-antennal carina.

Antennae in female (fig. 7) with scape elongate and slender, hardly swollen near base and at apex, not quite reaching the median ocellus; pedicellus about one and a half times as long as broad; annellus transverse; funicle not greatly swollen, having first segment about one and a half times as long as broad; club a little shorter than the two preceding funicle segments. Antennae in male (fig. 8) with scape similar but shorter and thicker, not nearly reaching median ocellus;



FIGS. 1–6.—(1–2) *Uga menoni* sp. n.: (1) head, seen from above; (2) head in hind view. (3–5) *Uga sinensis* sp. n.: (3) head, seen from above; (4) head in front view; (5) top of head in hind view. (6) *Uga javanica* sp. n., top of head in hind view.

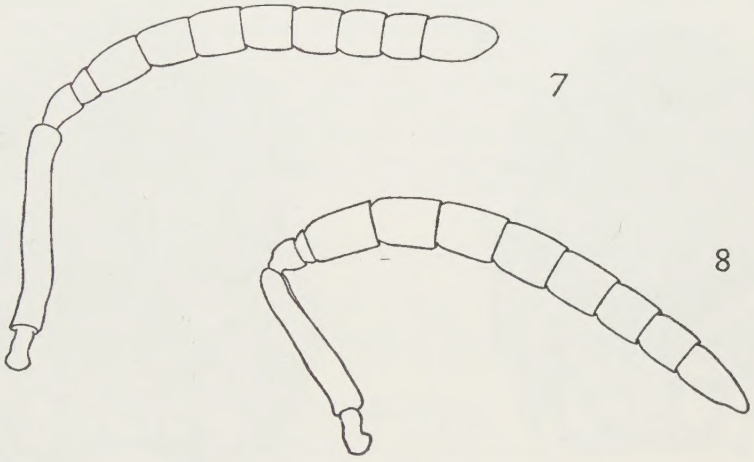
pedicellus rounded, slightly transverse; annellus ring-like; flagellum decidedly thicker than in female, almost cylindrical, tapering from second funicle segment, having first segment one and a half times to twice as long as broad.

Pronotal collar with anterior margin undeveloped above but sharp at sides. Notauli percurrent, deep and rather sharp (figs. 9–12). Scutellum greatly swollen, almost semicircularly or pyramidally arched in side view, and with two strong teeth behind, the hind margin greatly overhanging the frenum (fig. 11). Axillulae in Asiatic and Australian species densely beset with silvery hairs arising from more or less fine punctures. Mesopleura having acetabula with about 12–15 more or less regular costae running from front to rear. Propodeum (figs. 9–10) with reticulate sculpture in most species very coarse; carina submedia (Bouček, 1952; Pl. II) emitting

a strong costula before middle, and carina accessoria emitting a lateral carina further forward, which runs into a weak tooth on the carina lateralis behind the spiracle.

Gaster of female with first large tergite more than half its total length dorsally and, except in African species, as follows : broadly smooth above, the tergites at sides with fine punctures bearing conspicuous hairs, more or less in rows, and to a greater or lesser extent very finely scaly-reticulate to minutely punctate, this sculpture approaching nearer the mid-line on the hinder tergites up to the fifth, distinctly stronger and not interrupted in mid-line on the sixth (*i.e.* the true eighth segment), this tergite bearing coarse but superficial piliferous punctures, into which the finer sculpture intrudes, especially near mid-line ; last tergite more or less sharply keeled mid-dorsally. Gaster of male having the fine sculpture not or hardly interrupted in mid-line on the third to fifth large tergites, and the last tergite not or at least not nearly so sharply keeled mid-dorsally. The African species differs in having the gaster finely coriaceous throughout, except for the fine segmental margins, and the last tergite of the female not always keeled mid-dorsally.

Fore wings with marginal and postmarginal veins together less than a quarter the length of subcostal ; postmarginal very short, not reaching as far as tip of uncus.



FIGS. 7–8.—*Uga menoni* sp. n., right antenna of : (7) female ; (8) male.

Leg sculpture finely rugulose or coriaceo-reticulate. Mid-femora clavate (fig. 12). Hind femora beneath with a pointed or sharply-rounded lobe before middle, and a gently convex lobe beyond, and with a series of about 30 or more comb-teeth from sharp lobe to apex. The sharp lobe is not acute except in the African species.

Length about 3–4·5 mm.

Greyish-black insects with silvery pubescence. Generally the tibiae and the fore and mid-femora are slightly rufescent, decidedly so at apices, and the tarsi are more or less pale testaceous. The Indian species, however, may be as above or may have the legs almost entirely dark, with only the fore tarsi rufescent.

Interspecific characters have not been sought in the proportions of the segments of the gaster, mid-dorsally or otherwise, on account of the obviously varying effect of the telescoping of the segments, nor in the general proportions of the hind femora, on account of the variation found within the Indian species.

Description of Species

Uga menoni sp. n.

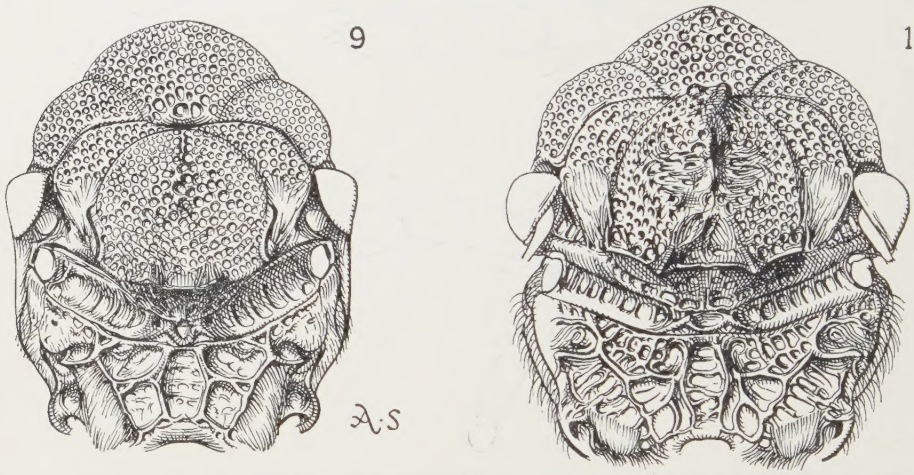
Head, seen from above (fig. 1), broadly and very deeply emarginate anteriorly, rather strongly narrowed and rounded behind eyes, 0·4 times eye length behind eye ; with inter-ocellar protuberances, as seen in hind view (fig. 2), of moderate strength ; in facial view with cheeks somewhat rounded. *Antennal flagellum* of female (fig. 7) distinctly swollen, having seventh segment

distinctly broader than long ; of male (fig. 8) almost cylindrical, having first segment one and a half times as long as broad and seventh a little longer than broad. *Pronotum* and *mesoscutum*, as seen in side view (fig. 12), strongly convex, the scutellum subpyramidally arched. *Hind coxae* strongly and densely silvery-pubescent, with rugulose sculpture fine. *Fore wings* with a more or less H-shaped fascia, usually extended towards base.

India : Orissa, numerous ♀♀, ♂♂, ex *Epilachna* species (Coleoptera : Coccinellidae) (per *S. G. Sen Gupta*).

Holotype ♀ in British Museum (Nat. Hist.) : paratypes in British Museum (Nat. Hist.) ; Indian Museum, Calcutta ; Transvaal Museum, Pretoria ; Australian National Collection ; Hokkaido University, Sapporo ; Canadian National Collection, Ottawa ; United States National Museum ; Museum d'Histoire Naturelle, Paris ; Národní Museum, Prague ; and Naturhistoriska Riksmuseum, Stockholm.

Named after Dr. R. G. Ramdas Menon, who made a special study of the Haltichellinae during his stay in London in 1948, and left with the author a manuscript key to the world genera.



Figs 9–10.—Thorax, in hind view, and propodeum of : (9) *Uga menoni* sp. n. ; (10) *Uga colliscutellum* (Girault).

Uga sinensis sp. n.

Head, seen from above (fig. 3), strongly transverse, rather narrowly and only moderately deeply emarginate anteriorly, rather strongly narrowed behind eyes but not much rounded, 0·4 times eye length behind eye ; with inter-ocellar protuberances, as seen in hind view (fig. 5), weak ; in facial view relatively short, with cheeks sharply narrowed to mouth (fig. 4). *Antennal flagellum* of female distinctly swollen, having seventh segment distinctly broader than long ; of male with first segment twice as long as broad [broken beyond the third funicle in the only specimen available]. *Pronotum* and *mesoscutum*, as seen in side view, strongly convex, but less strongly than in *menoni* sp. n. (fig. 12), the scutellum almost semicircularly arched. *Hind coxae* strongly and densely silvery-pubescent, with rugulose sculpture very fine. *Fore wings* as described for *U. menoni* sp. n.

China : Canton, 5 ♀, 1 ♂, ex *Epilachna* sp., 1950 (*W. E. Hoffmann*).

Holotype ♀, allotype and paratypes in British Museum (Nat. Hist.).

Uga javanica sp. n.

Head, seen from above, broadly and deeply emarginate anteriorly, moderately narrowed and hardly rounded behind eyes, 0·5 times eye length behind eye ; with inter-ocellar protuberances, as seen in hind view (fig. 6), strong ; in facial view with cheeks somewhat rounded. *Antennal flagellum* of female hardly swollen, having seventh segment slightly longer than broad ; that of

male distinctly tapering from second segment, having first segment one and three-quarter times and seventh about one and a quarter times as long as broad. *Hind coxae* for the most part normally silvery-pubescent, though strongly so just below the smooth area, with rugulose sculpture moderately fine. *Fore wings* as described for *U. menoni* sp. n.

JAVA : Bogor, 1 ♀, 3 ♂, *ex* pupae of *Epilachna sparsa* subsp. 26-*punctata* Boisd., 1929 (*P. van der Goot*).

Holotype ♀ and allotype in United States National Museum ; paratypes in British Museum (Nat. Hist.) and Institute of Plant Diseases and Pests, Bogor.

Uga colliscutellum (Girault)

1922, *Stomatoceras colliscutellum* Girault, *Insec. Inscit. Menst.* **10** : 148.
1930, *Uga colliscutellum* Girault, *New Pests from Australia* **8** : 4. Brisbane, privately printed.

Head, seen from above, broadly and very deeply emarginate anteriorly, strongly narrowed but not much rounded behind eyes, 0·5 times eye length behind eye ; with inter-ocellar protuberances of moderate strength (*cf.* fig. 2) ; in facial view with cheeks narrowed at about half a right angle and hardly rounded. *Antennal flagellum* of female distinctly swollen, having seventh segment, quadrate ; that of male distinctly tapering from second segment, having first segment over one and a half times as long as broad and seventh distinctly broader than long. *Pronotum, mesoscutum* and *scutellum* exceptionally strongly vaulted, the pronotum rising in middle almost to a point, the scapulae strongly convex, the middle lobe of mesoscutum pyramidal and the scutellum strongly so (fig. 11). *Hind coxae* normally silvery-pubescent, with rugulose sculpture coarse. Hind femora and tibiae more rugulose than in the other species treated. *Fore wings* as described for *U. menoni* sp. n.

AUSTRALIA : Queensland, Brisbane, 2 ♀, ex *Epilachna* 28-*punctata* Fabr., xi.1915 (*H. Jarvis* per *H. Tryon*) (one the holotype) ; 1 ♂, i.1930 (*A. R. Brimblecombe*) (labelled as allotype) ; 1 ♀, 1.ix.1931 (*H. Tryon*).

Holotype ♀, allotype, and two specimens in Queensland Museum, Brisbane.

Uga coriacea sp. n.

Head, seen from above, rather broadly and very deeply emarginate anteriorly, very strongly narrowed and rounded behind eyes, 0·4 times eye length behind eye ; with inter-ocellar protuberances, as seen in hind view, very weak ; in facial view with cheeks weakly rounded. Scrobal impression without stronger striae beside inter-antennal carina. *Antennal flagellum* of female distinctly swollen, having seventh segment distinctly broader than long. *Pronotum, mesoscutum* and *scutellum*, in side view, about as in *menoni* sp. n. Axillulae relatively small, sparsely pilose. *Hind coxae* normally silvery-pubescent, with rugulose sculpture rather coarse. Hind femora with sharp lobe beneath acute. *Fore wings* hyaline, or with infuscation, except just below marginal vein, weak.

UGANDA : Kawanda, *ex* pupa of *Epilachna* sp. (Coleoptera : Coccinellidae) (det. R. D. Pope), 1 ♀, xi.1939 (*T. H. C. Taylor*). SOUTH AFRICA : Cape Province, Port Alfred, ex *Epilachna canina* (Fabr.), 1 ♀, 2 ♂, iv.1956 (*J. S. Taylor*).

Holotype ♀ and paratypes in British Museum (Nat. Hist.).

KEY TO SPECIES OF THE GENUS *Uga* GIRAULT

1 Fore wings hyaline, or with infuscation, except just below marginal vein, weak : axillulae relatively small, sparsely pilose : gaster finely coriaceous throughout except for the fine segmental margins : last tergite (female) not always keeled mid-dorsally : hind femora with sharp lobe acute : [inter-ocellar protuberances very weak] : *Africa* . . . . . **coriacea** sp. n.

– Fore wings with a more or less H-shaped fascia usually extended towards base : axillulae large, densely silvery-pilose (figs. 9–12) : gaster with first large tergite and the one (male) or four (female) following smooth above : last tergite of female keeled mid-dorsally : hind femora with sharp lobe not acute (fig. 12) 2

FIG. 11.—*Uga colliscutellum* (Girault), part of thorax, in side view, for comparison with figure 12.

FIG. 12.—*Uga menoni* sp. n., whole insect in side view. (*Arthur Smith del.*)

2 Scutellum exceptionally strongly vaulted, middle lobe of mesoscutum pyramidal and scapulae strongly convex (fig. 11) : sculpture of head and thorax coarser than in the following species : *Australia* . . **colliscutellum** (Girault)
– Scutellum less strongly vaulted, middle lobe of mesoscutum subpyramidal or dome-shaped (*e.g.* fig. 12) and scapulae less strongly convex : body sculpture finer : *Asia* 3
3 Head, in hind view, with inter-ocellar protuberances strong (fig. 6) ; as seen from above moderately narrowed behind eyes : hind coxae for the most part normally silvery-pubescent, though strongly so just below smooth area . . . . . **javanica** sp. n.
– Head, in hind view, with inter-ocellar protuberances of moderate strength or weak (*e.g.* figs. 2, 5) ; as seen from above rather strongly narrowed behind eyes : hind coxae strongly and densely silvery-pubescent 4
4 Head, as seen from above, very deeply emarginate anteriorly and rather strongly rounded behind eyes (fig. 1) : inter-ocellar protuberances of moderate strength (fig. 2) . . . . . **menoni** sp. n.
– Head, as seen from above, only moderately deeply emarginate anteriorly, and not much rounded behind eyes (fig. 3) : inter-ocellar protuberances very weak (fig. 5) . . . . . **sinensis** sp. n.

Acknowledgment

The author wishes to express his appreciation of the skill of Mr. Arthur Smith, who drew figures 9–12. The picture of a whole insect (fig. 12) should make the genus recognisable by any specialist on the systematics of Hymenoptera.

Reference

Bouček, Z., 1952, The first revision of the European species of the family Chalcididae (Hymenoptera). *Sborn. ent. Odd. nár. Mus. Praze* **27**, suppl. 1 : 1–108 + 17 pl.

TAXONOMIC NOTES ON THREE SPECIES OF MIRINAE (HEMIPTERA : MIRIDAE), INCLUDING THE DESCRIPTIONS OF TWO NEW SPECIES

By Thomas R. Odhiambo

*(Kawanda Agricultural Research Station, Kampala, Uganda)**

The descriptions given below are based on material collected in Uganda (some specimens by using a mercury-vapour light trap) and on material collected in South Africa and sent to me through the kindness of Dr. L. L. J. Ossowski, of the Wattle Research Institute, University of Natal, to whom I am very grateful.

Tribe MIRINI Hahn, 1831

Charagochilus endecus sp. n. (Figs. 1–4)

Characterised by the type of pubescence and puncturation on the dorsum, by the structure of the antennae, pronotum and male genitalia, by the swollen and very thick pronotal collar, the shallow cuneal fracture, and by the colour.

Male

Structure. Lora swollen. Rostrum extends nearly to apices of mid coxae. Eyes very large, distinctly granulose, reaching gula below. Antennal segment I extends far beyond apex of anteclypeus ; segment II linear in thickness, except at base. Pronotum with posterior half very strongly convex ; posterior margin more than two and a half times as wide as anterior margin ; collar a little swollen, very thick, three times as thick as antennal segment II, and nearly as thick as the vertex is wide. Cuneus longer than broad ; brachial vein of hemelytral membrane only very slightly curved along its length, rounded at apex. Legs rather short ; hind tarsus with segment I shorter than segment II, segments II and III about equal. Dorsum densely covered with pale erect hairs intermixed with some fuscous or black hairs, particularly so on pronotum, these dark hairs appearing in more or less distinct patches, the hairs very long on anterior half of pronotum ; dorsum also covered with some clumps of metallic shiny adpressed pubescence, especially on hemelytra ; venter and legs with pale erect or sub-erect hairs, some very long ones along ventral margin of femora ; tibiae also with pale spines. Pronotum and scutellum coarsely punctate, pronotal collar impunctate ; clavus with two rows adjacent to the claval sutures, and corium with a row along the embolial suture, of coarse punctures. Genitalia illustrated in figures 1–4.

Measurements (in mm.) of a single male :—length of body 4·15, width across hemelytra 2·08 ; length of head 0·62, width across eyes 0·84 ; width of eye 0·31 ; width of interocular space of vertex 0·22 ; ratio, vertex : eye 1 : 0·71 ; length of antennal segments, I 0·52, II 1·22, III 0·66 (IV missing) ; median length of pronotum 1·20, basal width 1·72.

Colour. Head greenish-yellow. Antennae black ; base and apex of segment I very narrowly, and base of segments II and III fairly broadly, greenish-yellow. Pronotum greenish-yellow ; irregular markings along posterior margin, and some punctures near the centre on either side of the disc, infuscate. Scutellum greenish-yellow, with an irregular fuscous median transverse band. Clavus dull fuscous to black, base brownish-yellow ; corium dull fuscous to black, base, outer two-thirds of basal half, and a large spot at apex, pale yellow or yellowish-brown ; cuneus pale yellow, with fuscous apex and a spot at inner basal angle. Membrane yellowish ; veins largely. and a larger apical area on membrane, infuscate. Venter and legs greenish-yellow ; an irregular band in the middle of hind femora, and some markings towards apices of all femora, infuscate.

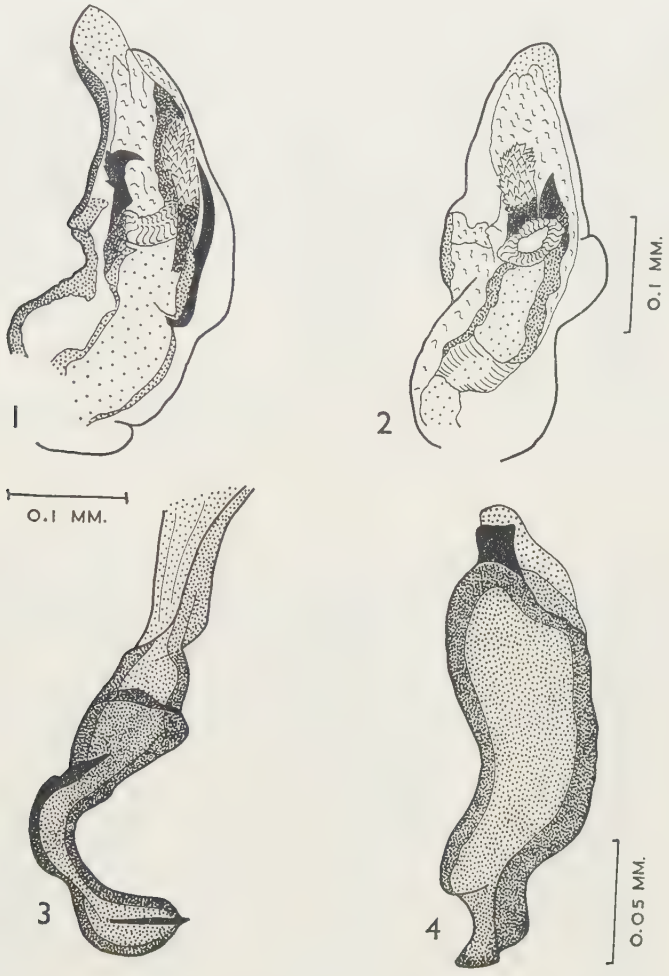
Female

Unknown.

Now at Queens' College, Cambridge.

Holotype ♂, UGANDA : Ankole, Ibanda, 29–30.v.1959 (*G. W. Kanakulya*).
The holotype will be sent to the British Museum (Nat. Hist.).

C. endecus differs from the four previously known Ethiopian species of the genus (*C. gyllenhali* (Fallén), *C. nigritus* Odhiambo, *C. obscurellus* Odhiambo and *C. punctigerus* Odhiambo (Odhiambo, 1959)) in four main characters : (1) the type of the pubescence on the dorsum, (2) the structure of the pronotum and its collar,



FIGS. 1–4.—*Charagochilus endecus* sp. n., male genitalia : (1) aedeagus (left lateral aspect) ; (2) the same (ventral aspect) ; (3) left paramere ; (4) right paramere.

(3) the cuneal fracture and (4) the structure of the male genitalia. Whereas in these four species the dorsum is covered with metallic shiny adpressed pubescence interspersed with erect or suberect pale hairs, in the new species the dorsum is covered with a mixture of dark and pale erect hairs interspersed with some metallic shiny white adpressed pubescence—a condition approaching that found in the species belonging to the *Tinginotum*-complex. The pronotum is strongly convex posteriorly, more so than in the other species of the genus, and the collar is swollen and very thick. The cuneal fracture is deep or very deep in the four species ; in *C. endecus* it is not. Although the structure of the aedeagus in *C. endecus* follows the general pattern

obtaining in the genus, the structure of the parameres is rather different, and in the case of the left paramere it is reminiscent of that found in the genus *Eurystylus* Stål. On the basis of these considerations, it would seem that *C. endecus* belongs to a species-group distinct from that to which the other four Ethiopian species belong.

Genus *Lygidolon* Reuter, 1907

Poppius (1912) gives a good re-description of this genus. The following notes have been provided to supplement some points in the earlier generic diagnoses.

Dorsum, although shiny, very densely covered with small shallow punctures ; in addition the scutellum very finely transversely rugose ; frons sparsely punctate and finely shagreened. Dorsum not glabrous, as stated by Poppius (*loc. cit.*) ; covered by minute pale hairs coming out of shallow punctures, but the hairs easily rubbed off. Second antennal segment linear in thickness. except at base where it is narrower ; the segment as a whole as thick as or only a little thinner than first segment ; third and fourth antennal segments distinctly thinner. Hemelytra slightly widened in the female ; large areole of membrane rounded at apex ; metathoracic wings without hamus. Hind femora about one and a half times as long as fore femora ; first segment of hind tarsus distinctly shorter than second.

Lygidolon laevigatum Reuter, 1907 (Figs. 5–14)

A re-description of the species, based on specimens from East and South Africa is provided below.

Male

Structure. Head appears twice as high as long when viewed from the side. Rostrum extends to apices of mid coxae ; first rostral segment reaches bases of fore coxae. Antennal segment II slightly thinner than segment I. Pronotum with posterior margin two and a half times as wide as anterior margin. Tibial spines about as long as tibial thickness ; hind tarsus with segments II and III subequal. Genitalia illustrated in figures 5–10.

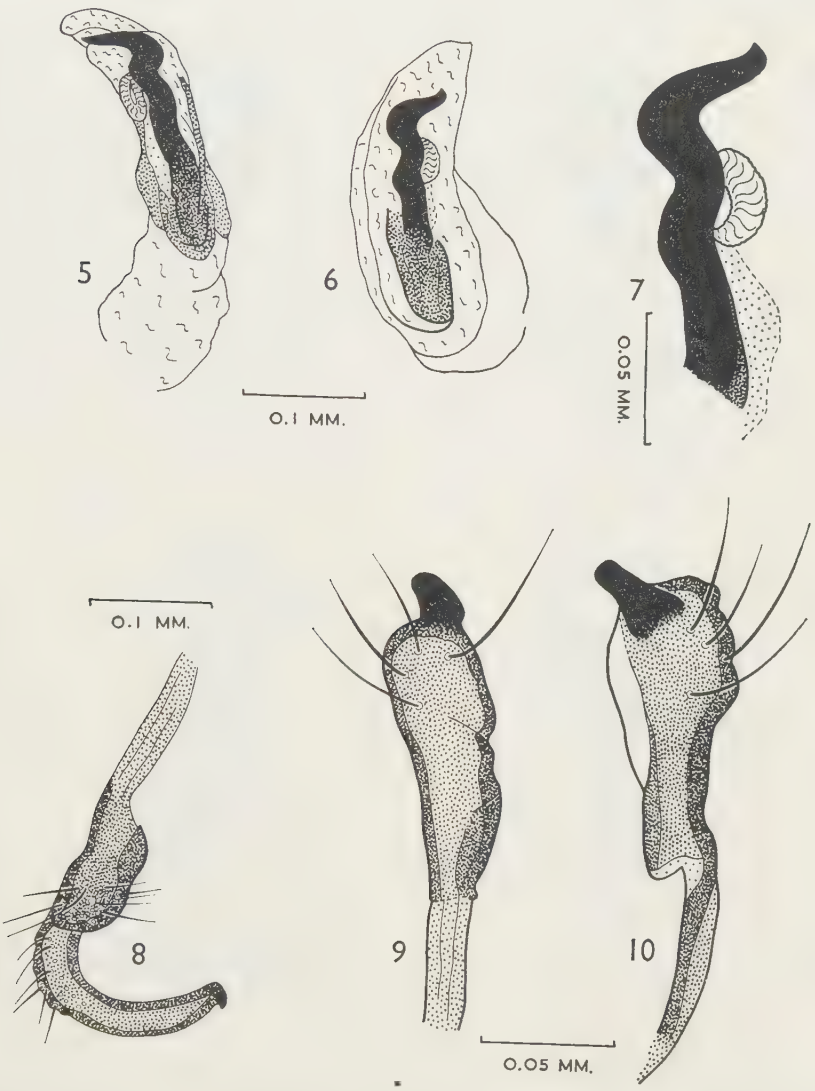
Measurements (of nine males in mm., first figure representing the mean, figures in brackets the range) :—length of body 3·25 (2·9–3·55), width across hemelytra 1·49 (1·40–1·54) ; length of head 0·64 (0·62–0·66), width across eyes 0·93 (0·90–0·96) ; width of eye 0·34 (0·32–0·35) ; width of interocular space of vertex 0·26 (0·24–0·28) ; ratio, vertex : eye 1 : 0·77 (1 : 0·69–1 : 0·85) ; length of antennal segments, I 0·28 (0·26–0·30), II 1·14 (1·10–1·16), III 0·52 (0·46–0·58), IV 0·38 (0·32–0·44) ; median length of pronotum 0·74 (0·72–0·76), basal width 1·30 (1·24–1·38).

Colour. Shiny. Head fuscous to black ; vertex extensively, or only at base, yellowish or yellowish-brown ; bucculae pale yellow. Antennae yellowish ; segment II with almost distal half black ; segments III and IV sometimes extensively yellowish-brown towards apex. Pronotum, including propleura, black ; posterior margin of disc narrowly, and ventral margin of propleura broadly, yellowish-white ; disc sometimes largely brownish-yellow. Scutellum black ; apex broadly, or sometimes the disc largely, yellow. Clavus fuscous to black ; basal margin near claval suture paler, brownish ; sometimes this pale area more extensive, covering half or more of the clavus. Corium yellowish, sometimes with a brownish tinge ; inner apical angle, sometimes enlarged into an irregular transverse band just before the cuneal fracture, and sometimes external margin of embolium except at base and apex, brownish to black. Cuneus yellowish ; most of apical half fuscous to black. Membrane smoky-grey ; veins towards apices, an area inside the large areole, a narrow area adjoining the inner lateral margin of cuneus towards apex, and a spot near the external margin of membrane, pale or whitish. Abdomen brown to fuscous ; base and sometimes ventral aspect yellowish-brown ; abdomen sometimes largely yellowish. Thoracic venter fuscous to black ; probasisternum pale yellow ; ostiolar peritreme partially, and sometimes also metepisternum and ventral aspect of mesobasisternum, yellowish-brown. Legs yellowish ; coxae sometimes very narrowly yellowish-brown at base ; distal halves of hind femora brownish or reddish-brown or with some reddish markings ; tibiae narrowly at apex, the last tarsal segment, sometimes also bases of hind tibiae, infuscate ; basal tarsal segment yellowish-brown ; tibial spines black, those on fore tibiae yellowish-brown.

Female

Structure. Similar to that of the male.

Measurements (in mm.) of seven females :—length of body 3·25 (3·1–3·5), width across hemelytra 1·65 (1·56–1·74) ; length of head 0·67 (0·64–0·70), width across eyes 0·93 (0·88–0·98) ; width of eye 0·30 (0·29–0·32) ; width of interocular space of vertex 0·33 (0·30–0·36) ; ratio, vertex : eye 1 : 1·11 (1 : 1·03–1 : 1·20) ; length of antennal segments, I 0·27 (0·26–0·28), II 1·06 (1·02–1·12),



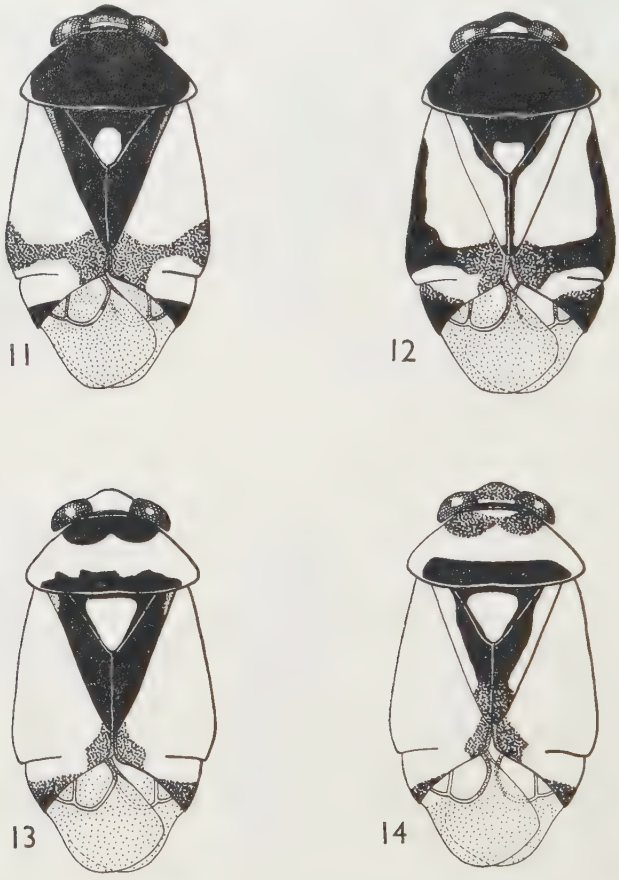
FIGS. 5–10.—*Lygidolon laevigatum* Reuter, male genitalia : (5) aedeagus, vesica exserted (dorsal aspect) ; (6) aedeagus (right lateral aspect) ; (7) the same, vesical spiculum ; (8) left paramere ; (9), (10) right paramere.

III 0·55 (0·48–0·60), IV 0·37 (0·30–0·44) ; median length of pronotum 0·79 (0·76–0·84), basal width 1·44 (1·32–1·56).

Colour. As in the male, except : the body tinged with red, especially on the paler areas ; vertex and frons yellowish-red ; pronotum and scutellum extensively or largely pale in colour ; abdomen sometimes entirely yellowish-brown, or sometimes entirely black.

Specimens examined.—Uganda: Kawanda, 1 ♀, 23.vii.1945; 3 ♂, 3 ♀, 6.ix.1945; 1 ♀, 8.xi.1945 (all *H. S. Darling*). Kawanda, 1 ♂ at mercury-vapour light, 15.vii.1958. Serere Experiment Station, 1 ♂ on cotton, 11.viii.1957 (*T. R. Odhiambo*). South Africa: Natal, Pietermaritzburg, 4 ♂, 5 ♀ ex *Acacia mollissima*, xii.1957 (*L. L. J. Ossowski*).

L. laevigatum is now known from Kenya, Uganda, Tanganyika, and Natal, and further collecting may well show a wider distribution. Dr. Ossowski regards this Mirid as a pest of black wattle in Natal.



Figs. 11–14.—*Lygidolon laevigatum* Reuter: variations in the pattern of the dark markings on the dorsum.

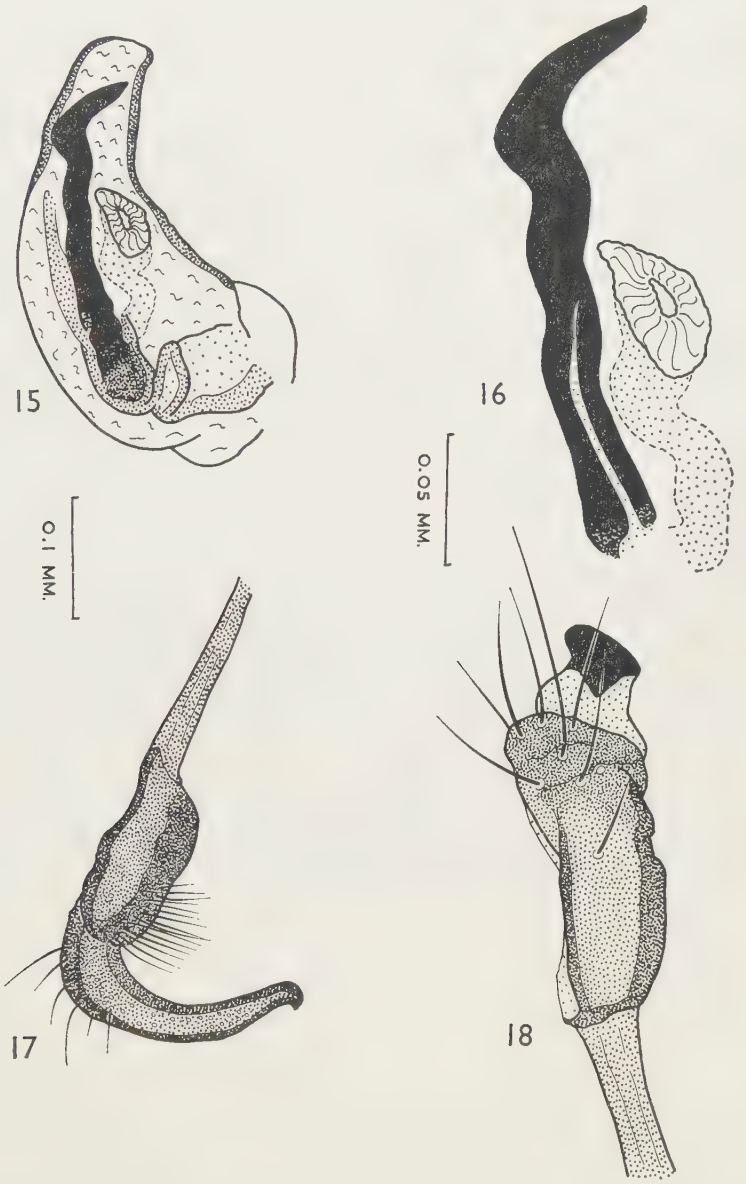
Lygidolon scutellare sp. n. (Figs. 15–18)

Characterised by the colour, especially the dark colour of the scutellum and the venter, and by the structure of the antennae and male genitalia.

Male

Structure. Head appears about twice as high as long when viewed from the side. Rostrum extends distinctly beyond apices of fore coxae, reaching posterior margin of mesobasisternum; first rostral segment reaches bases of fore coxae. Antennal segment II about as thick as segment I. Pronotum with posterior margin nearly three times as wide as anterior margin. Tibial spines slightly longer than the tibiae are thick; hind tarsus with segments II and III about equal. Genitalia illustrated in figures 15–18.

Measurements (in mm.) of two males :—length of body 3·6–3·85, width across hemelytra 1·52–1·58 ; length of head 0·70, width across eyes 0·98–1·02 ; width of eye 0·37–0·39 ; width of interocular space of vertex 0·24 ; ratio, vertex : eye 1 : 0·62–1 : 0·65 ; length of antennal segments, I 0·32–0·34, II 1·44–1·46, III 0·62, IV 0·40 ; median length of pronotum 0·90–0·92, basal width 1·40–1·48.



FIGS. 15–18.—*Lygidolon scutellare* sp. n., male genitalia : (15) aedeagus (right lateral aspect) ; (16) the same, vesical spiculum ; (17) left paramere ; (18) right paramere.

Colour. Shiny. General colour dark. Head black ; vertex pale yellow or yellowish-brown posteriorly. Antennal segment I yellowish ; segment II yellowish, distal half to two-thirds black ; segments III and IV fuscous to black, base of segment III obscurely yellowish-brown. Pronotum and propleura black ; posterior margin of pronotum and ventral margin of propleura narrowly yellowish-white. Scutellum entirely black. Clavus wholly black ; corium yellowish-

white, a transverse apical band and embolium black ; cuneus black, a large spot at base and extending on to the corium yellowish-white ; membrane smoky fuscous, veins and a spot adjoining apex of cuneus paler, brownish-yellow or whitish. Abdomen black. Thoracic venter black ; episternal sclerites bordering fore and mid coxae narrowly, and posterior and ventral one-third of ostiolar peritreme, yellowish. Coxae yellowish, bases broadly fuscous ; femora fuscous, bases and apices yellowish ; tibiae and tarsi yellowish, sometimes apices of tibiae narrowly and basal tarsal segment wholly yellowish-brown, last tarsal segment largely fuscous ; tibial spines black, those on fore tibiae yellowish-brown.

Female

Structure. Antennal segment II slightly thinner than segment I. Otherwise, structure as in the male.

Measurements (in mm.) of two females :—length of body 3·5–3·85, width across hemelytra 1·50–1·62 ; length of head 0·70–0·72, width across eyes 1·00–1·04 ; width of eye 0·36–0·38 ; width of interocular space of vertex 0·24–0·32 ; ratio, vertex : eye 1 : 0·63–1 : 0·89 ; length of antennal segments, I 0·30–0·32, II 1·28–1·40, III 0·60, IV 0·44 ; median length of pronotum 0·88–0·96, basal width 1·40–1·54.

Colour. Similar to that of the male, except : the pale areas sometimes have a reddish tinge ; clavus sometimes brownish at base, corium and cuneus sometimes more extensively yellowish-white ; fore femora reddish-brown, sometimes darker ; spines on fore tibiae black.

Holotype ♂, Uganda : Kawanda, 31.vii.1958 ; *allotype* ♀, same locality, 6.iii.1959. *Paratypes*, same locality, 1 ♀, 10.ii.1958 ; 1 ♂, 23.i.1959 (all at mercury-vapour light).

The holotype and allotype will be sent to the British Museum (Nat. Hist.) ; the paratypes are at Kawanda.

Although *L. laevigatum* Reuter is very variable in colour markings (figs. 11–14), *L. scutellare* may be distinguished from it by colour—as well as by structural differences. In the new species the bucculae are black, the scutellum is entirely black, the venter is more extensively darker, and the colour of the coxae and femora is different. It may also be distinguished by its longer second antennal segment, by its somewhat narrower vertex, and by its relatively shorter rostrum.

References

Odhiambo, T. R., 1959, Notes on the East African Miridae (Hemiptera).—X : *Charagochilus* Fieber and *Polymerus* Hahn. *Ann. Mag. nat. Hist.* (13) **2** : 29–40.

Poppius, B., 1912, Die Miriden der Äthiopischen Region, I : Mirina, Cylapina, Bryocorina. *Acta Soc. Sci. Fenn.* **41** (3) : 76 ; fig. 6.

SUR LES TYPES DE CARABIDAE (COLEOPTERA) AFRICAINS DÉCRITS PAR A. MURRAY

par P. Basilewsky
(*Musée Royal du Congo Belge, Tervuren*)

Dans son travail intitulé *List of Coleoptera received from Old Calabar, on the West Coast of Africa* et paru de 1857 à 1859 dans les *Annals and Magazine of Natural History*, Andrew Murray fut un des premiers entomologistes à nous faire connaître les Carabidae de la côte occidentale d'Afrique. Aussi les espèces décrites par cet auteur méritent d'être bien connues. A l'exception de quelques Scaritini, dont les types ont été étudiés par M. Bänninger, je ne pense pas que les spécimens de Murray aient été examinés par aucun des spécialistes qui se sont livrés plus tard à des recherches approfondies sur ces insectes. Ces espèces ont été interprétées soit d'après les descriptions originales, le plus souvent excellentes mais forcément incomplètes, soit d'après les doubles que Murray a communiqué à quelques carabidologues contemporains, notamment Chaudoir, Putzeys et Schaum. Aussi était-il important de réexaminer ces types à la lumière de nos connaissances actuelles et avec nos critères modernes, afin de les fixer définitivement.

Lors d'un récent séjour au Department of Entomology du British Museum (Natural History), à Londres, j'ai pu étudier ces exemplaires, et c'est le résultat de cet examen que je publie ici. Je tiens à exprimer ma reconnaissance à mon cher collègue Mr. E. B. Britton qui a eu la grande amabilité de me rendre ce travail possible et de faciliter ma tâche par sa grande compétence.

Ce n'est qu'exceptionnellement que Murray a fait mention, dans ses descriptions, du nombre d'exemplaires qu'il avait sous les yeux. Chaque fois qu'il a spécifié que la forme décrite n'était représentée que par un spécimen unique, ce spécimen devient automatiquement l'holotype. Pour toutes les autres espèces, il m'a fallu désigner un lectotype, même si elles n'étaient plus représentées que par un seul individu car, comme je l'ai dit plus haut, Murray a envoyé des doubles à plusiers de ses correspondants et ces spécimens existent actuellement ou peuvent être encore retrouvés. J'ai indiqué le sexe de ces lectotypes chaque fois qu'une telle indication était possible sans dissection. À part quelques exceptions, ces spécimens centenaires sont en parfait état de conservation.

Tout le matériel étudié par Murray provient de Old Calabar, sur le côte du Nigeria.

Cicindela vicina var. *confusa* Murray (1857, *Ann. Mag. nat. Hist.* (2) **19** : 154). Lectotype ♂.

Myriochile fastidiosa subsp. *vicina* (Dejean).

Les différences relevées par Murray sont très faibles et individuelles, *vicina* étant une forme variable. Cette synonymie a déja été mentionnée par W. Horn.

Cicindela vicina var. *obliteranda* Murray (*loc. cit.* : 155). Lectotype ♀.

Myriochile melancholica (Fabricius). **(Syn. nov.)**.

Murray n'a relevé que de légères différences de sculpture et du dessin élytral entre son exemplaire et *vicina* ; il n'a pas observé les caractères très nets qui séparent *melancholica* de *vicina*, notamment la tache miroitante discale de la femelle et la coloration métallique des pattes. Dans le *Coleopterorum Catalogus*, W. Horn cite *obliteranda* comme synonyme de *vicina*, ce qui est erroné ; il est évident que cet auteur s'est basé uniquement sur la description de Murray mais n'a jamais vu un de ses exemplaires.

Cicindela lowei Murray (*loc. cit.* : 155). Lectotype ♀.
Lophyra luxeri (Dejean).

Ne diffère du type de Dejean que par l'absence de tache claire dans les deux premiers tiers de l'élytre, à l'exception des courtes bandes transversales émanant de la bordure. W. Horn a déja signalé cette synonymie.

Tefflus planifrons Murray (*loc. cit.* : 156). Lectotype ♀.
Tefflus megerlei (Fabricius).

Synonymie connue depuis longtemps.

Drypta pectoralis Murray (*loc. cit.* : 157). Lectotype ♀.
Dendrocellus bocandei (Laferté), 1849.

Synonymie déja mentionnée par Duvivier (1892, *Ann. Soc. ent. Belg.* **36** : 264), d'après la description originale, et que je puis confirmer.

Galerita femoralis Murray (*loc. cit.* : 158). Lectotype ♀.
Galeritiola femoralis (Murray).

Galerita gracilis Murray (*loc. cit.* : 159). Lectotype ♂.
Galeritiola attelaboides (Fabricius).

Synonymie établie par Harold en 1879, et que j'ai contrôlée.

Pheropsophus minor Murray (*loc. cit.* : 160). Lectotype ♀.
Pheropsophus minor Murray.

Un paratype ♂ se trouve au Musée Royal du Congo Belge.

Le lectotype a une très petite tache jaune ovale de chaque côté du pronotum, absente chez le paratype.

Lebia bis-binotata Murray (*loc. cit.* : 313).
Lebia bisbinotata Murray.

Aucun exemplaire de Murray ne se trouve plus au British Museum, ni dans aucune autre collection que j'ai pu voir. L'espèce est bien connue. *L. tetragramma* Chaudoir, 1870, dont j'ai vu le type au Muséum de Paris, lui est identique.

Lebia clavicornis Murray (*loc. cit.* : 314). Lectotype.
Lebidema clavicornis (Murray).

Rhaphidognatha (gen. nov.) *trimaculata* Murray (*loc. cit.* : 316). Lectotype.
Lobodontus murrayi Britton.

Le nouveau nom donné par E. B. Britton en 1937 (*Proc. R. ent. Soc. Lond.* (B) **6** : 236) était nécessaire par suite de l'existence d'un *Lobodontus trimaculatus* Chaudoir, 1878.

Nycteis championi Murray (*loc. cit.* : 319). Lectotype.
Neocoptodera championi (Murray). **(Comb. nov.)**

Belonognatha rugiceps Murray (*loc. cit.* : 320). Lectotype.
Coptoderina rugiceps (Murray). **(Comb. nov.)**

Belonognatha obesa Murray (*loc. cit.* : 322). Lectotype.
Coptoderina triloba (Fabricius).

Synonymie signalée par Burgeon (1937, *Ann. Mus. Congo belge*, 4° (*Zool.*) (3) ii **2** : 347).

Belonognatha quadrinotata Murray (*loc. cit.* : 323). Lectotype.
Coptoderina triloba (Fabricius).

Synonymie signalée par Burgeon (1937, *l.c.* : 347). Le type de Murray n'est qu'un exemplaire de petite taille, à taches claires élytrales peu étendues.

Catascopus rufipes var. *rugifrons* Murray (*loc. cit.* : 325). Lectotype.
Catascopus specularis Imhoff, 1843.

Synonymie mentionée par Burgeon (1936, *Bull. Ann. Soc. ent. Belg.* **76** : 80), d'après une communication de H. E. Andrewes. Le lectotype est en fort mauvais état, ce qui avait déja été signalé en 1936 ; tout l'avant-corps est absent.

Catascopus compressus Murray (*loc. cit.* : 325). Lectotype.
Lobodontus compressus (Murray).

Nycteis intermedia Murray (*loc. cit.* : 444). Lectotype.
Coptoderina laticollis (Laferté), 1849. **(Syn. et comb. nov.)**

Le type de Laferté a été examiné au Muséum de Paris.

Goniotropis wyliei Murray (*loc. cit.* : 445). Lectotype ♂.
Pseudozaena lutea (Hope).

Synonymie reconnue par Alluaud en 1925.

Stereostoma (gen. nov.) *whitei* Murray (*loc. cit.* : 449). Lectotype ♂.
Stereostoma (s. str.) *whitei* Murray.

Stereostoma solidum Murray (*loc. cit.* : 450). Lectotype ♀.
Stereostoma (s. str.) *solidum* Murray.

Buderes (gen. nov.) *oberti* Murray (*loc. cit.* : 452). Lectotype ♂.
Buderes oberti Murray.

Scarites hercules Murray (*loc. cit.* : 455). Lectotype.
Neochryopus savagei (Hope).

Synonymie connue depuis longtemps.

Scarites ajax Murray (*loc. cit.* : 456). Lectotype.
Neochryopus savagei (Hope).

Synonymie connue depuis longtemps.

Scarites patroclus Murray (*loc. cit.* : 457). Lectotype.
Scarites patroclus Murray.

Ainsi que l'a établi dernièrement M. Bänninger (1956, *Ent. Arb. Mus. Frey* **7** : 405 ; 1958, *Rev. Zool. Bot. afr.* **58** : 318, 321) il s'agit là d'une bonne espèce, confondue depuis Chaudoir avec *senegalensis* Dejean.

Scarites rotundicollis Murray (*loc. cit.* : 458). Lectotype.
Menigius rotundicollis (Murray).

Le type de Murray a été vu par M. Bänninger en 1938.

Scarites clivinoides Murray (*loc. cit.* : 459).

Ne se trouve plus au British Museum.
Distichus gagatinus (Dejean).

Synonymie établie par M. Bänninger en 1937 ; cet auteur semble avoir vu le type.

Craspedophorus conicus Murray (1857, *loc. cit.*, 2, **20** : 117). Lectotype.
Craspedophorus tropicus (Hope), 1842.

Synonymie déja établie par Chaudoir en 1878.

Craspedophorus strangulatus Murray (*loc. cit.* : 119). Lectotype.
Craspedophorus strangulatus Murray.

Craspedophorus arcuato-collis Murray (*loc. cit.* : 120). Lectotype.
Epigraphus arcuatocollis (Murray).

Craspedophorus lafertei Murray (*loc. cit.* : 121). Lectotype.
Craspedophorus lafertei Murray.

Craspedophorus symei Murray (*loc. cit.* : 124). Lectotype.
Microcosmodes symei (Murray).

Cet exemplaire est bien caractérisé par le pronotum à largeur maximale située nettement en arrière du milieu de la longeur, à côtés presque rectilignes et non arqués en avant de cette largeur, et l'angle postérieur très saillant et pointu, ainsi que la tache jaune antérieure des élytres qui atteint la base externe de ces derniers.

Craspedophorus vicinus Murray (*loc. cit.* : 125). Lectotype.
Microsomodes vicinus (Murray).

Homalolachnus elongatus Murray (1858, *loc. cit.* (3) **1** : 127). Lectotype ♂.
Homalolachnus vertagoides (Laferté), 1851.

J'ai vu le type de Laferté au Muséum de Paris.

Chlaenius feronoides Murray (*loc. cit.* : 130). Lectotype ♂.
Pachydinodes feronoides (Murray).

Chlaenius immunitus Murray (*loc. cit.* : 131). Lectotype ♂.
Epomis immunitus (Murray).

J'ai déja parlé antérieurement de cette espèce (1955, *Trans. R. ent. Soc. Lond.* **107** : 99, 110).

Chlaenius fairmairei Murray (*loc. cit.* : 132). Lectotype ♂.
Chlaenites fairmairei (Murray).

Espèce proche d'*alluaudi* Basilewsky, mais distincte par les intervalles plus convexes, les stries plus fortement ponctuées et le pronotum parsemé de quelques gros points.

Chlaenius waddellii Murray (*loc. cit.* : 133).

Rien n'existe sous ce nom à Londres. Par contre, l'Institut royal des Sciences naturelles de Belgique à Bruxelles possède dans la collection Putzeys, une femelle provenant d'Old Calabar et portant une étiquette de Murray ; c'est donc le lectotype.
Macrochlaenites elongatus subsp. *waddelli* (Murray).

J'ai déja parlé antérieurement de cette forme (1950, *Rev. franç. Ent.* **17** : 114, 116).

Ectenognathus (gen. nov.) *dryptoides Murray* (1858, *loc. cit.* (3) **2** : 340). Holotype ♀.
Ectenognathus dryptoides Murray.

Oodes obesus Murray (*loc. cit.* : 341). Lectotype ♂.
Hoplolenus obesus (Murray).

Oodes politus Murray (*loc. cit.* : 343). Holotype.

Déja lors de sa description Murray déplorait le mauvais état de l'unique exemplaire qu'il avait sous les yeux. L'holotype est, en effet, dans un état fort précaire, et je ne puis guère qu'établir qu'il s'agit bien d'un *Oodes* et qu'il rentre dans le sous-genre *Paroodes* Jeannel. Une attribution spécifique n'est plus possible et j'estime qu'il convient de considérer l'exemplaire de Murray comme non identifiable et de supprimer le nom.

Diatypus (gen. nov.) *dohrnii* Murray (*loc. cit.* : 344). Lectotype ♀.
Diatypus dohrni Murray.

Espèce correctement interprétée dans ma Révision générale des Harpalinae d'Afrique et de Madagascar (1950, *Ann. Mus. Congo belge* 8° (*Zool.*) **6** : 26).

Diatypus smithii Murray (*loc. cit.* : 345). Lectotype ♂.
Diatypus smithi Murray.

Espèce correctement interprétée dans ma révision (*l.c.* : 28).

Orthogonius rugiceps Murray (*loc. cit.* : 346). Lectotype ♂.
Orthogonius latus Hope.

Orthogonius clarkii Murray (loc. cit. : 347). Lectotype ♂.
Orthogonius clarkei Murray.

Orthogonius pinguis Murray (*loc. cit.* : 348). Lectotype ♂.
Orthogonius pinguis Murray.

Hypolithus iris Murray (1859, *loc. cit.* (3) **3** : 27). Lectotype ♂.
Parasiopelus iris (Murray). (**Comb. nov.**)
Hyparpalus congoanus Burgeon, (1936, *Ann. Mus. Congo belge* 4° (*Zool.*) (3) ii **2** : 289). (**Syn. nov.**)
Parasiopelus congoanus Burgeon, (Basilewsky, 1950, *id.*, 8° (*Zool.*) **6** : 221).

Hyparpalus congoanus Burgeon est identique au type de Murray, et le nom de Burgeon tombe en synonymie.

Cette identité m'a été signalée il y a quelques années par Miss C. M. F. von Hayek, du British Museum (Nat. Hist.), qui l'avait constatée en comparant le type de Murray à ma description de *P. congoanus* Burgeon, mais ne l'a pas publiée. J'ai pu constater l'exactitude de cette observation. Dans ma Révision (1951, *l.c.* **9** : 316) j'ai cité *Hypolithus iris* parmi les espèces qu'il m'avait été impossible d'interpréter.

Siopelus (gen. nov.) *calabaricus* Murray (*loc. cit.* : 28). Lectotype ♂.
Siopelus calabaricus Murray.

Espèce correctement interprétée dans ma Révision (1950, *l.c.* **6** : 177).

Platymetopus granulosus Murray (*loc. cit.* : 29). Lectotype ♂.
Platymetopus schoenherri Dejean.

J'ai déja cité cette synonymie (*l.c.* : 146).

Anaulax (gen. nov.) *iridescens* Murray (1859, *loc. cit.* (3) **4** : 117). Holotype ♀.
Metaxenus iridescens (Murray). (**Comb. nov.**)

Par la même occasion le genre *Anaulax* Murray devient synonyme de *Metaxenus* Motschulsky, 1858 (**syn. nov.**).

Anchomenus angulaticollis Murray (*loc. cit.* : 118). Lectotype ♂.
Leptagonum insignicorne (Laferté), 1853.

J'ai déja établi cette synonymie antérieurement (1953, *Explor. Parc. Nat. Upemba* **10**, *Carab.* : 73) en me basant sur l'examen d'un paratype de Laferté et d'un exemplaire comparé au type de Murray par R. Oberthür. Je puis confirmer maintenant cette synonymie après comparaison des deux types.

Anchomenus planaticollis Murray (*loc. cit.* : 119). *Lectotype* ♀.
Metagonum planaticolle (Murray).

Anchomenus patroboides Murray (*loc. cit.* : 120). Lectotype ♂.
Metagonum patroboides (Murray).

Sept genres nouveaux ont été établis par Murray dans le même travail :

Rhaphidognatha Murray (1857, *Ann. Mag. nat. Hist.* (2) **19** : 316).

Espèce-type : *Rhaphidognatha trimaculata* Murray, 1857, par monotypie.

Cette espèce rentrant dans la genre *Lobodontus* Chaudoir, 1842, *Rhapidognatha* en est synonyme.

Stereostoma Murray (*loc. cit.* : 448).

Genre établi pour deux espèces : *St. whitei* Murray et *St. solidum* Murray. L'espèce-type n'ayant pas encore été fixée à ma connaisance, je désigne *Stereostoma whitei* Murray, 1857.

Buderes Murray (*loc. cit.* : 451).

Espèce-type : *Buderes oberti* Murray, 1857, par monotypie.

Ectenognathus Murray (1858, *loc. cit.* (3) **2** : 340).

Espèce-type : *Ectenognathus dryptoides* Murray, 1858, par monotypie.

Diatypus Murray (*loc. cit.* : 343).

Genre établi pour deux espèces : *D. dohrni* Murray et *D. smithi* Murray.

Espèce-type : *Diatypus dohrni* Murray, 1858 (R. Jeannel, 1946, *Rev. franç. Ent.* **12** : 158).

Siopelus Murray (1859, *loc. cit.* (3) **3** : 27).

Espèce-type : *Siopelus calabaricus* Murray, 1859, par monotypie.

Anaulax Murray (1859, *loc. cit.* (3) **4** : 116).

Espèce-type : *Anaulax iridescens* Murray, 1859, par monotypie.

Comme il a été dit plus haut, ce nom est synonyme de *Metaxenus* Motschulsky, 1858.

AN ADDITIONAL NOTE ON THE GENUS *PROTOPIOPHILA* DUDA (DIPTERA : PIOPHILIDAE)

By R. A. Harrison

(*Plant Diseases Division, Department of Scientific and Industrial Research, Auckland, New Zealand*)

A revision of the genus *Protopiophila* Duda has recently been published (Harrison, 1960). Owing to an unfortunate lapse, the existence of two previously described species of the genus was noticed too late for inclusion in that paper. The species are *Piophila* (*Protopiophila*) *aethiopica* Hennig, 1951, and *P.* (*P.*) *leucodactyla* Hennig, 1954. Both species occur in Africa. They are undoubtedly members of *Protopiophila* and this note is published to complete the revision of the genus.

A new key is given. It is based on the previous key (Harrison, *loc. cit.*) and includes all known species of the genus.

Key to Species of *Protopiophila* Duda

1	Prescutellars present	2
–	Prescutellars absent	4
2	Body length over 3·0 mm.	3
–	Body length under 3·0 mm.	**scutellata** Harrison
3	Anterior tarsus black with apical segment in ♂ white . . .	**aethiopica** (Hennig)
–	Anterior tarsus black with apical two segments in both sexes white	**leucodactyla** (Hennig)
4	Mesopleuron bare of hairs and dusting	**latipes** (Meigen)
–	Mesopleuron with dusting and/or hairs	5
5	Mesopleuron with dusting and hairs	**australis** Harrison
–	Mesopleuron with dusting and without hairs	**contecta** (Walker)

Protopiophila aethiopica (Hennig)

Piophila (*Protopiophila*) *aethiopica* Hennig, 1951, *Beitr. Ent.* **1** : 70 ; 1954, *Ibid.* **4** : 642.

This species has been recently and adequately described for both sexes (Hennig, 1951 and 1954).

Holotype ♂.—Transvaal : Johannesburg (*F. Zumpt*), (Coll. No. 1209 in Commonwealth Institute of Entomology, Lond.).

Distribution.—Transvaal.

Remarks.—The characters of the anterior tarsus readily separate this species from *P. leucodactyla.* As Hennig (1954) points out, *P. aethiopica* and *P. leucodactyla* are very closely related but in view of the presence of prescutellar bristles they are related more closely to *P. scutellata* than to *P. latipes.*

Protopiophila leucodactyla (Hennig)

Piophila (*Protopiophila*) *leucodactyla* Hennig, 1954, *Beitr. Ent.* **4** : 641.

This species has been recently and adequately described for both sexes (Hennig) 1954).

Holotype ♂.—East Africa : Msingi, 30.iii–13.iv.1952, in Staatlichen Museum für Naturkunde, Stuttgart.

Distribution.—East Africa.

Remarks.—Most readily separated from *P. aethiopica*, the other African species, by the key characters of coloration of the anterior tarsus.

References

Harrison, R. A., 1960, A revision of the genus *Protopiophila* Duda (Diptera : Piophilidae). *Proc. R. ent. Soc. Lond.* (B) **29** : 1–6.

Hennig, W., 1951, Neue Acalyptraten aus Europa und Südafrika (Diptera : Piophilidae, Helomyzidae, Lauxaniidae). *Beitr. Ent.* **1** : 70–76.

—— 1954, Piophilidae und Sepsidae aus Ost-Afrika (Diptera). *Ibid.* **4** : 641–3.

Book Notices.

Common Malayan Butterflies. By R. Morrell. 8vo. London (Longmans), 1960. Pp. xii + 64 : text illust. [*Malayan Nature Handbooks*]. 12s. 6d.

This work, which forms part of the *Malayan Nature Handbooks* Series, is a brief introduction to the more common species which are most likely to be seen by the beginner or the newcomer to Malaya. The illustrations and descriptions of the species have been carefully limited to those which any observant person might encounter, and references to rarities and species confined to inaccessible country have been avoided.

The introduction, which includes notes on anatomy and mimicry, provides information on collecting and breeding and on the preservation of specimens. There are, in addition to the descriptions, brief notes on distribution and life histories, as well as coloured illustrations, of over one hundred species. An index of English and Latin names is also given.

Insects of Hawaii. Vol. 10. Diptera : Nematocera-Brachycera. By D. Elmo Hardy. 8vo. Honolulu (University of Hawaii Press), 1960. Pp. ix, 368, text illust. Price $7.00.

This latest addition to the *Insects of Hawaii* series is the first volume on the Diptera of Hawaii and deals with 147 species and 5 subspecies of the suborders Nematocera and Brachycera. Thirteen families, 67 genera and 17 subgenera are included. A checklist and a summary of the new nomenclatorial changes made are given, In an introductory section of 19 pages, nomenclature, morphology, economic importance, taxonomy and techniques for the collection and study of Diptera are dealt with generally. There is a key to the families of all the suborders of the Hawaiian Diptera with notes and descriptions of nine families of the suborder Brachycera.

A review of the biological control of insects and weeds in Australia and Australian New Guinea. By F. Wilson. 4to. Commonwealth Agricultural Bureaux, 1960. Pp. v, 102. 25s. 0d.

This review is a partial response to the need for a general summary of the investigations in biological control made on behalf of various countries of the Commonwealth. It lists all introductions of beneficial insects made in attempts at biological control of insect and other pests, and weeds, and assesses the results as far as possible ; reference is also made to native and accidentally introduced natural enemies in Australia. Amongst the subjects discussed are the use of native natural enemies and of diseases, of native enemies other than insects and diseases, and the adverse effects of insecticides on biological control in Australia.

A bibliography and index of pests and natural enemies is included.

THE AFRICAN SPECIES OF *ZYRAS* SUBGENUS *ANTRONIA* BERNHAUER (COLEOPTERA : STAPHYLINIDAE)

By H. R. Last

Bernhauer created the subgenus *Antronia* for his species *orbicollis* (1926, *Arch. Naturg.* **42** : 54). It is characterised chiefly by the formation of the pronotum, which is transverse and of an inverse trapeze shape. The lateral margins are deeply depressed and more or less reflexed, the posterior margin bevelled on either side of a deep transverse depression, the disk raised like a cushion. After examination of further specimens I have to amend Bernhauer's description referring to the antennae, as I am including three new species which have the antennae laterally somewhat compressed, as in species of the subgenera *Parophthalmonia* and *Androdonia*, and this character is not one cited by Bernhauer in his original description of *Antronia*, with which the three species agree, in all other respects. Furthermore, after examination of the type specimen of *wittei* Cameron, I find that this species must be removed from the subgenus *Acrothoraconia* and placed in the subgenus *Antronia*. With the addition of *wittei* and six new species described in this paper, there are now eight species in the subgenus. The most marked differences between them are in the structure of the antennae (figs. 1–4).

With the incorporation of species having laterally compressed antennae within this subgenus, Bernhauer's original key to the subgenera must be slightly amended as follows. Couplet No. 1 should read " antennae not or only a little laterally compressed, more strongly so in *dilatus* sp. n., *ineptus* sp. n. and *compressus* sp. n."

Type species of the subgenus : *orbicollis* Bernhauer.

Key to the Species of *Zyras* Subgenus *Antronia*

1 Antennae laterally compressed 2
– Antennae not laterally compressed 4
2 Temples strongly dilated (fig. 5) . . . . . **dilatus** sp. n.
– Temples not dilated 3
3 Segments five to ten of antennae transverse, size smaller, 6 mm. **ineptus** sp. n.
– Segments five to ten of antennae not transverse, size larger, 9–10 mm. **compressus** sp. n.
4 Head and pronotum with microsculpture hardly perceptible, elytra pubescent **vividus** sp. n.
– Head and pronotum with distinct reticulation, elytra not pubescent . . . 5
5 Antennae very long, all segments much longer than broad (fig. 2) . . . 6
– Antennae shorter, segments transverse or only a little longer than broad (figs. 3 and 4) 7
6 Species smaller, 4·5–5 mm. ; more slender, pronotum clear red . **gracilis** sp. n.
– Species larger, 6–7 mm. ; more robust, pronotum darker . . . **wittei** Cameron
7 Antennae very robust (fig. 4), penultimate segment of maxillary palpi much enlarged . . . . . **nocturnus** sp. n.
– Antennae not robust (fig. 3), penultimate segment of maxillary palpi slender **orbicollis** Bernhauer

Zyras (Antronia) vividus sp. n.

Differs from *orbicollis* Bernh. and *wittei* Cameron in the colour, the almost total absence of microsculpture on the head and pronotum, the more rounded sides of the pronotum, the denser puncturation and the pubescence of the elytra and abdomen.

Colour : bright reddish-yellow, legs and antennae paler, head and pronotum shining, elytra and abdomen dull. *Head* transverse (3·5 : 2), a little narrower than pronotum, shining without perceptible microsculpture ; eyes large and convex, temples short, one-third longitudinal diameter of eyes, slightly dilated ; antennae long with all segments longer than broad ; first segment dilated and emarginate at apex, second and third of equal length but two-thirds length of first, fourth to seventh three-quarters the length of the two preceding ; all segments with very fine pubescence ; maxillary palpi reddish-yellow. *Pronotum* transverse (4·5 : 3), broadest at anterior fourth with angles rounded, lateral margins broadly depressed but not so reflexed as in the majority of species of the genus ; posterior angles very obtuse and with an extremely small tooth ; impunctate except slightly on the lateral margins and with very scanty short pubescence. *Elytra* transverse (5 : 3·25) parallel, a little narrower at shoulders than broadest part of pronotum, densely and finely punctured and with moderately dense pubescence ; only slightly emarginate near postero-external angles. *Abdomen* broad, narrowing considerably to the apex, all tergites moderately densely and finely punctured ; paratergites with distinct golden pubescence ; legs long, pale reddish-yellow and similar to other species of the subgenus.

Length : 6 mm.

Type, Sierra Leone : Bomatok, 27.v.1925 (*E. Hargreaves*). Unique ; in British Museum (Nat. Hist.). I have retained the name over which this specimen was standing in Dr. Cameron's collection.

Zyras (Antronia) nocturnus sp. n.

This species is quite distinct from other species of the subgenus.

Of the same structure and coloration as *Z. orbicollis* Bernh., but antennae and penultimate segment of maxillary palpi much more robust, puncturation of pronotum and elytra coarser and abdomen much more strongly punctured, especially at base of tergites. *Head* black, labrum reddish-yellow, transverse (4·5 : 3), very finely and sparingly punctured, distinctly reticulate, shining ; eyes large and convex, their longitudinal diameter four times the length of the temples ; a central elevation present between base of antennae ; antennae reddish-brown, robust, reaching well beyond posterior margin of pronotum ; first segment apically dilated and deeply emarginate, second and third half length of first, fourth to tenth transverse, the last parallel sided, bluntly acuminate and longer than penultimate two together ; maxillary palpi robust, penultimate segment strongly broadening to apex. *Pronotum* transverse (5 : 4), a little broader than head, with a median depression, lateral margins almost straight, converging posteriorly where angles form a minute tooth which appears to be characteristic of the subgenus ; anterior angles rounded ; laterally broadly depressed ; a large deep sulcus before the scutellum, distinctly reticulate and asperately punctured. *Elytra* transverse (6 : 5), a little dilated posteriorly, strongly and densely punctured, the interstices reticulate, narrower than diameter of punctures, weakly emarginate at postero-external angles ; suture and posterior margins narrowly bordered, scutellum large. *Abdomen* shining, without microsculpture, tergites three to six with rather large punctures which become denser towards base of tergites ; seventh tergite with lateral furrows, eighth tergite of female with short pubescence, apical margin finely and irregularly crenulate ; legs yellow, finely pubescent.

Length : 8 mm.

Type ♀, Natal : Ladysmith, x.1952, at light (*Dr. A. H. Newton*) ; in author's collection.

Zyras (Antronia) dilatus sp. n.

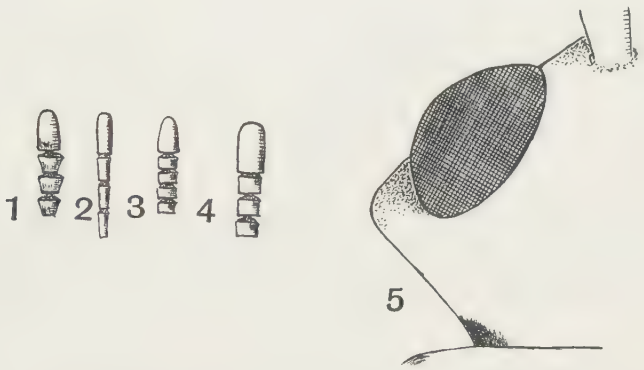
This species is unmistakable owing to the temples which are angularly dilated beyond the outer circumference of the eyes. It also differs from all the other species of the subgenus so far described in having the abdomen finely punctured throughout.

Colour : head dark red on vertex, darker towards inner margins of eyes, pronotum reddish-brown, elytra black with reddish central area extending from base, abdomen dark red, suffused with black for apical half of each tergite, legs paler ; antennae, except first segment, darker. *Head* transverse (6 : 3), shining with faint microsculpture, sparingly but distinctly punctured except for a small area on vertex ; eyes convex, twice length of temples, which are angularly dilated (fig. 5) with a shining protuberance between base of antennae ; first segment of antennae

broadened and deeply emarginate at apex, second two thirds length of first, third a little longer than second but shorter than first, fourth a little shorter than third, fifth to tenth as long as broad, last segment half as long again as penultimate ; from fourth segment all laterally compressed and broadened at apex, with fine pubescence. *Pronotum* transverse (7·5 : 5·5), broader than head, broader at apical third, laterally depressed, only slightly reflexed, broadly convex, anterior margin straight, posterior margin shorter, corners distinctly but finely " toothed ", with a deep transverse depression opposite scutellum, narrowly bevelled on either side ; finely and densely punctured, more coarsely on lateral depressions ; finely reticulate, shining. *Elytra* quadrate at shoulders, transverse at posterior margin (9·5 : 7), densely punctured, indistinct microsculpture, shining, with fine short pubescence ; slightly sinuate at postero-external corners, narrowly bordered, scutellum alutaceous. *Abdomen* finely and evenly asperately punctured, finely pubescent ; without microsculpture ; paratergites more distinctly pubescent, seventh tergite with distinct lateral furrows, eighth tergite of female with more shallow furrows, apical margin rounded ; posterior tibiae compressed.

Length : 10 mm.

Type ♀, Natal : Malvern, 1908 (*C. N. Barker*). Unique ; in the collection of the South African Museum.



Figs. 1–5.—*Zyras* (*Antronia*) spp. Apical segments of antennae of : (1) *compressus* sp. n. ; (2) *gracilis* sp. n. ; (3) *orbicollis* Bernhauer ; (4) *nocturnus* sp. n. ; (5) temple and eye of *dilatus* sp. n.

Zyras (Antronia) ineptus sp. n.

The smallest of the three species with laterally compressed antennae so far described ; more parallel that all the other species of the subgenus, and the lateral margins of pronotum only shallowly depressed and barely reflexed (figs. 6–7).

Colour : reddish-yellow, head and abdomen a little darker. *Head* transverse (4 : 2), shining, with microsculpture indistinct, very sparingly and minutely punctured ; eyes convex, slightly larger than temples which are quite distinct ; antennae with second segment half length of first, third slightly longer than second, fourth to tenth slightly transverse, last segment equal to two penultimate together ; from segment three laterally compressed, broader at apex, finely pubescent. *Pronotum* transverse (4 : 3), as broad as head, very sparingly and finely punctured and reticulate ; broadest at anterior third, lateral depressions not deep, barely reflexed ; anterior margin rounded, posterior corners distinct, minutely " toothed ", a deep transverse depression opposite scutellum ; posterior margin shorter than anterior margin. *Elytra* a little longer than broad at shoulders, as broad as long at posterior margin ; strongly and densely punctured, with faint microsculpture and decumbent pubescence, very slightly sinuate at postero-external corners, narrowly bordered, more broadly along suture. *Abdomen* parallel, shining, without microsculpture ; third tergite sparingly asperately punctured, other tergites almost glabrous except for two pairs of median punctures bearing setae ; paratergites with distinct pubescence ; legs with posterior tibiae compressed.

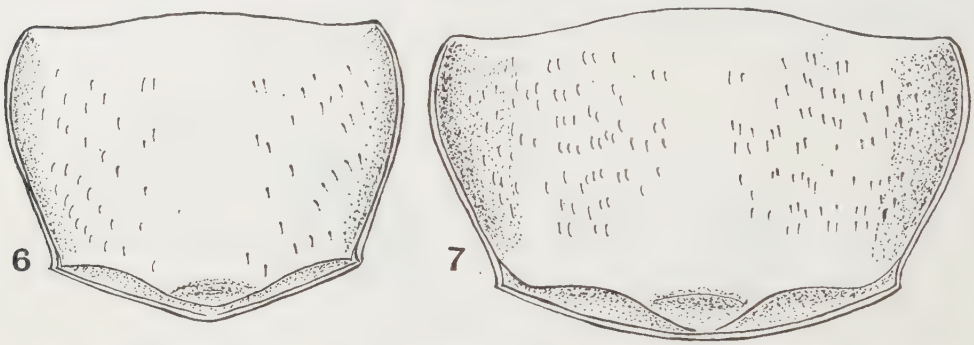
Length : 6 mm.

Type ♀, Natal : Ladysmith, iii.1953, at light (*Dr. A. H. Newton*). In my collection. Paratype, Angola : Dundo, iii.1948, at electric light (*A. de B. Machado*) ; in the British Museum (Nat. Hist.).

Zyras (Antronia) compressus sp. n.

Of the same build and in most respects like *wittei* Cameron, except that the antennae are much compressed laterally ; third tergite also punctured. In all other details similar to *orbicollis* Bernh.

Colour : dark reddish-brown, head and tergites darker. *Head* transverse (5 : 3), finely reticulate, sparingly punctured and sparingly pubescent ; eyes large convex, their longitudinal diameter a little more than twice the length of temples ; a slight elevation between base of antennae ; first segment robust, larger and deeply emarginate at apex, second half length of first, third one-quarter longer than second but not equal to length of first, fourth a little shorter than second ; segments five to ten only slightly longer than broad, fractionally shorter than fourth, last segment half as long again as penultimate ; segments three to eleven strongly compressed, broadened at apex ; finely pubescent. *Pronotum* transverse (6 : 5), of shape typical of the subgenus, distinctly



Figs. 6–7.—*Zyras* (*Antronia*) sp.: (6) *ineptus* sp. n., pronotum; (7) *orbicollis* Bernhauer, pronotum.

finely reticulate, asperately but not densely punctured ; lateral margins depressed and reflexed, deep transverse depression opposite scutellum, with bevelled posterior margin on either side, posterior corners sharp. *Elytra* transverse, (6·75 : 5·25) at shoulders, (8 : 5·25) at posterior margin, densely punctured, with indistinct microsculpture ; postero-external corners slightly sinuate, posterior and sutural margins distinctly bordered. *Abdomen* narrower at apex ; third tergite strongly but not densely punctured, fourth sparingly punctured at base, fifth much less so, others impunctate, without microsculpture, seventh tergite with lateral furrows ; posterior tarsi long, a little shorter than tibiae.

Length : 10 mm.

Type ♀, Congo Belge : Kaswabilenga (700 m.), 17.x.1947 (*Mission G. F. de Witte*) ; in the collection of the Institut des Parcs Nationaux du Congo Belge.

Zyras (Antronia) gracilis sp. n.

Smaller than *Z.* (*Antronia*) *orbicollis* Bernh. ; antennal segments all elongate ; nearest to *wittei* Cam., but smaller, more slender and pronotum bright reddish-yellow, elytra black ; antennae longer, with all segments longer, temples more rounded.

Colour : head, elytra and tergites five to seven black ; pronotum, antennae and mouth parts, third and fourth tergites reddish-yellow, legs paler. *Head* transverse (4·5 : 2·5), very sparingly and finely punctured towards posterior margins of eyes and temples, very finely reticulate, eyes large, very convex, their longitudinal diameter three times length of temples ; antennae very long, reaching to posterior margin of elytra ; all segments elongate, first broadened and emarginate at apex, second half length of first ; third a little longer but shorter than first ; segments four to ten as long as second, last segment one and half times length of penultimate, parallel, bluntly acuminate, all segments slightly broader at apex, not laterally compressed, pubescence very fine and short ; maxillary palpi, long, slender, setose. *Pronotum* a little transverse (4·5 : 4), as broad

as head, extremely finely reticulate and faintly asperately punctured, of the characteristic inverse trapezium shape, broadest at anterior third, thence converging to posterior angles, which are minutely toothed, anterior angles obtusely rounded, narrowly depressed and reflexed for whole length of lateral margin, a deep depression just before scutellum, posterior margin bevelled, more so at posterior angles, disc convex. *Elytra* slightly transverse, (5 : 4·5) at shoulders, (6 : 4·5) at posterior margin, very densely and rather asperately punctured, interstices reticulate, with a very fine very short but distinct pubescence, posterior margin hardly sinuate, narrowly bordered, suture with border wider ; scutellum finely reticulate. *Abdomen* narrowing considerably to apex, shining, with transverse microsculpture, impunctate, except for a few which are asperate on third tergite ; glabrous, except paratergites which have very fine short pubescence ; seventh tergite in both sexes with deep lateral furrows, all others in female simple. Some variation present in secondary characters of male ; in some specimens apical margin of third tergite bears a small central tooth and a central keel on the seventh tergite ; in others the third tergite is developed into two robust lateral prongs not reaching beyond apical edge of fourth tergite, with a smaller central prong ; fourth tergite bears a strongly developed plate with two robust vertical keels and a smaller between them, seventh tergite with a very robust tooth ; eighth narrow, bluntly acuminate, with two narrow lateral furrows ; legs long, especially the intermediate legs and posterior tarsi, which are nearly as long as tibiae.

Length : 6 mm.

Type ♂, NIGERIA : Ibadan, 1.v.1956 (*J. L. Gregory*) ; 33 paratypes, same data, at light ; in my collection.

I have seen other specimens in the collection of the Rev. C. E. Tottenham, also from Nigeria.

Zyras (*Antronia*) *orbicollis* Bernhauer

1926, *Arch. Naturg.* **92** : 54.

The type of this species is in the British Museum (Nat. Hist.) taken in NATAL : Van Reenen, Drakensberg, xii.1926 (*R. E. Turner*). There are two paratypes in the Bernhauer collection in the Chicago Natural History Museum, from ZULULAND : Eshowe, 1.iii.1926.

This species appears to be very common and is taken in large numbers at light-traps. It has also been taken in the Belgian Congo. The reddish fascia on the elytra is sometimes almost absent, but in other specimens covers quite a large area and is quite bright in colour. In specimens taken by Prof. P. Basilewsky, during his expedition to the Ruanda-Urundi, Congo Belge, the colour is bright yellow, leaving only the suture and the lateral and posterior margins black, thus producing quite a colourful variation.

The typical form was taken in numbers by Mr. J. Balfour-Browne during his visit to Natal in 1954.

Zyras (*Antronia*) *wittei* Cameron

1950, *Explor. Parc. Nat. Albert, Mission G. F. de Witte* 1933–35, fasc. **59** : 71.

Type, CONGO BELGE : Mai-Ya-Moto (Riv. Rutshuru), alt. 950 m., 5–6.xi.1934.

Paratype, Rutshuru, alt. 1285 m., 28.xii.1933, both in the Institut des Parcs Nationaux du Congo Belge.

ACKNOWLEDGMENTS

I wish to record my thanks to Dr. A. J. Hesse (South African Museum), and M. Le President V. Van Straelen (Institut des Parcs Nationaux du Congo Belge) for the loan of specimens and to Mr. E. B. Britton (British Museum (Nat. Hist.)) for facilities which have enabled me to make these studies.

ON SOME BRITISH SPECIES OF *PERILITUS* NEES (HYMENOPTERA : BRACONIDAE)

By O. W. Richards

(*Imperial College of Science and Technology, London*)

Muesebeck (1936, *Misc. Publ. U.S. Dep. Agric.* **241** : 11) has shown that *Perilitus* is the correct generic name for those Braconids which were earlier often placed in *Dinocampus* Forst. Lyle (1927, *Entomologist* **60** : 8) gives a key to four British species of which two are separated because the marginal cell ends nearer to the tip of the pterostigma than of the wing. These two are *P. coccinellae* (Schrank) (cited by Lyle as *terminatus* Nees ; synonymy established by Muesbeck, *l.c.* : 12) and what he calls *P. falciger* (Ruthe). The first-named species is easily recognised by its rugose scutellum and is a relatively common parasite of Coccinellid beetles (*see* Bryden, J. W. and Bishop, M. W. H., 1945, *Ent. mon. Mag.* **81** : 51–52). I have the following specimens : Essex, S.: Brentwood, 2 ♀ emerged 28.v.46 (*P. Freeman*) ; Middx.: Hampstead Heath, ♀ em. 28.v.46, cocoon 16.iv, ♀ em. 27.v.46 (*R. E. Blackith*) ; Bucks : Slough, cocoon 26.v, ♀ em. vi.37 (*S. Callaway*) ; Berks.: Silwood Park, cocoon 23.ix, ♀ emerged 6.x.53 (*O. W. R.*). In all these specimens the cocoon was found on a leaf with the adult Coccinellid (*C. septempunctata* L.) from which the parasitic larva had emerged sitting dead or moribund on the cocoon.

The other allied species in Lyle's key is *P. falciger* (Ruthe). In the British Museum collection under that name were 2 ♀, 3 ♂ from the Ruthe collection and a number of specimens reared from *Timarcha*, some of which had been seen by Lyle. Marshall (1896, *Spec. Hymén. Braconidae* **5** : 42) saw one specimen in the British Museum collection bred from *Timarcha goettingensis* (L.) (= *coriaria* Laich) ; I cannot now trace this specimen. It is presumably the one he also refers to in 1887 (*Trans. ent. Soc. Lond.* **1887** : 76) as being in the British Museum labelled by F. Smith " the larva from a living *Timarcha coriaria* F.". As far as I can make out, Marshall never saw the Ruthe specimens and he states (1896 : 5) that he found Ruthe's *Prodromus* difficult to use. In my opinion *P. falciger* is distinct from the species bred from *Timarcha* (= *P. sicheli* Giard, 1895) and I have a third allied species bred from *Phytodecta olivacea* (Forst.) and now identified as *P. dubius* (Wesm.). These three species form a small group separated from the remainder (*P. rutilus* (Nees), *etc.*) by the much shorter marginal cell in the fore wing (fig. 1) and from *P. coccinellae* by the smooth scutellum, the striate not rugose first gastral tergite, and by having the first recurrent vein (1 *m-cu*) almost interstitial (not received well before the first free sector of *Rs*).

The three species considered here may be separated as follows :

1 Ovipositor falcate, curved up, then down (fig. 2). Apical impression of scutellum narrow, transverse. Hypostomal keel raised and hyaline, produced into an almost finger-like process which projects in front of the lower articulation of the mandible. First segment of gaster with a narrow parallel-sided proximal part about as long as the broader distal part which in dorsal view is about as broad as the hind coxa and has regular longitudinal striations. (*Germany; not yet known as British*) . **P. falciger** (Ruthe)

– Ovipositor much more nearly straight, somewhat curved downwards. Apical impression of scutellum oval, much wider. Hypostomal keel rather strongly raised but hardly produced forwards into a process 2

2 Apical impression of scutellum relatively wide and deep, the lower margin forming a lip. First gastral segment with the narrow proximal part very short, the sides diverging almost from base, in dorsal view twice as wide

distally as hind coxa, with more regular parallel striae extending nearly to base. Part of costa beyond the pterostigma often shorter than adjacent posterior side of latter. Female with thorax and gaster black or nearly. (*Parasite of* Timarcha. *England, France*) . . . . . **P. sicheli** Giard

– Apical impression of scutellum about as wide but less deep and lower margin not produced into a lip. First gastral segment with the narrow parallel-sided proximal part about as long as the distal part which in dorsal view is at most one and a half times as broad as the hind coxa, and is more irregularly striate. Part of costa beyond the pterostigma about as long as or a little longer than the adjacent posterior side of the latter. Female with prothorax, mesopleuron and sternum and gaster after the first segment testaceous-orange. (*Parasite of* Phytodecta. *Belgium, England, Germany*) **P. dubius** (Wesmael)

1. *Perilitus dubius* (Wesmael)

Microctonus dubius Wesmael, 1838, *Nouv. Mém. Acad. Sci. Bruxelles* **11** : 143, ♂ ♀.

Female.—Black ; head testaceous, face paler (whitish-yellow), area round ocelli and antennae after first segment black ; whole prothorax and mesopleuron and sternum testaceous, a slight blackish cloud at top of mesopleuron ; sometimes disk of scutellum and side of propodeum partly, legs testaceous, a small black dorsal mark at base of hind tibia ; gaster after first segment mainly

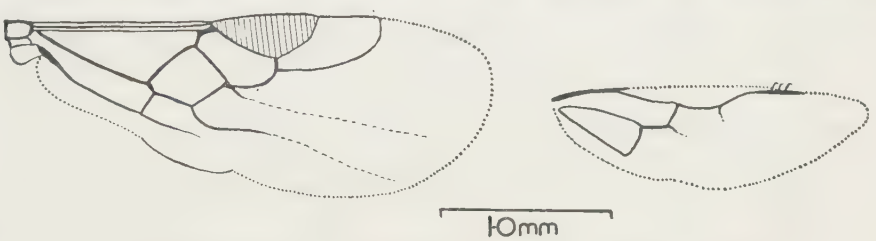


Fig. 1.—Right wings of *Perilitus dubius* (*Wesm.*) ♀, pubescence omitted.

testaceous ; wings hyaline, venation light brown ; length of fore wing 2·6–3·0 mm. ; length of body *c.* 2·5 mm.

Body almost bare ; with a little very short pale pubescence on head and dorsal side of thorax. Head shining, face dull, very finely granulate, ventral margin of clypeus very feebly convex ; antennae with 23 (8 spec.), 22 (28 spec.) or 21 (4 spec.) segments, segment 4 between three and four times as long as broad ; hypostomal keel mostly very fine but becoming higher anteriorly, and beneath mandibles forming a small transparent lobe which does not project very strongly. Sides of pronotum with a patch of rather weak rugosities. Mesoscutum mostly shining but with discal area granulate, posteriorly sometimes so densely so as to be dull ; mesopleuron mostly smooth and shining, with some punctures along dorsal and anterior margin and a dull punctured shallow depression in the centre of the mesepisternum ; scutellum smooth and shining, separated from the mesoscutum by a deep wide furrow crossed by a central keel, posteriorly with a broad oval very shallow depression. Propodeum regularly and rather finely rugose, rather more coarsely along the angles, in dorsal view slightly emarginate posteriorly, in lateral view distinctly but not quite vertically truncate. Fore wing (fig. 1) with marginal cell ending nearer to the tip of the pterostigma than of the wing, metacarp about as long or a little longer than the adjacent posterior side of pterostigma, 1 *m-cu* received just within the submarginal cell but almost interstitial with its outer boundary. Gaster with the petiole well marked, constituting more than the proximal half of the first segment, and rather less than half as wide as width of segment at apex, clearly narrower than hind coxa in dorsal view, posterior margin of segment about one and a half times the width of the hind coxa, whole segment about as long as first three segments of the hind tarsi, distinctly angled laterally at the spiracles, surface shining with ill-defined striae and punctures between them, striae only roughly parallel with one another and not very clearly traceable to the anterior end ; rest of gaster smooth and shining, mostly made up of the second and third segments which are hardly separate ; ovipositor (fig. 3), when normally extended, longer than half the gaster, as long as the hind tarsi, straight, in side view narrowed near apex owing to the curvature of the dorsal margin ; rarely, as in the type female, a little more curved.

Male.—Black; legs except coxae brown, hind femora darker dorsally; most of face dirty yellow; wings hyaline, venation brown; length of fore wing 2·3–2·6 mm.; length of body *c.* 2·3 mm.

Structurally resembles the female except in the following particulars: antennae with 26 (2 spec.), 25 (5 spec.), 24 (14 spec.), 23 (4 spec.) or 22 (2 spec.) segments, segment 4 four times as long as broad; hypostomal keel not raised anteriorly; thorax with more numerous punctures; first gastral segment less widened to the posterior margin, longitudinal striae less distinct.

Specimens examined: Belgium: type ♀ of *Microctonus dubius* Wesmael (Musée Royale, Brussels). Germany: ♀♂ (Ruthe Coll., ♂ under *P. falciger*, ♀ under *P. dubius*, B.M.). England: Berkshire, Sunninghill, Silwood Park, bred from adults of *Phytodecta olivacea* (Forst.) on broom (*Sarothamnus scoparius* (L.) Wimm.), 6.vi.–28.ix, 31 ♂, 43 ♀ (*O. W. Richards* and *N. Waloff*); also the following parasites beaten from broom at Silwood Park, 15.v.58, ♂, 5.vii.58, ♂, 5.vii.56, ♀, 5.viii.58, ♀, 19.viii.58, ♀, 4.ix.56, ♀.

In spite of regular beating of broom over five years, 1954–58, only the one male and four female parasites were seen in the field. The beetle first appears as hibernated adults in April. These beetles feed, pair and lay eggs and then those which do not die re-enter the soil for a second hibernation. Their offspring begin to become adult in August and the two lots often overlap for a week or two. Nearly all the parasites which emerge from the original hibernated beetles become adult in early May of the following year; those which emerge from the offspring of the hibernated beetles become adult in the second half of June of the following year (rarely a little earlier or later). The two emergences of the parasite are quite distinct and do not overlap; on the average the wasps of the later emergence are smaller and more individuals seem to have come from each host. The factors which determine this life-history are not fully understood but it appears that the host-beetle may determine the speed of development of the parasite. Two individuals (1 ♂, 1 ♀) were bred on 26.vi.58 from larvae which had been collected on 6.viii.57. They are apparently quite similar to the ordinary form which has been bred from the adult beetles.

I am much indebted to Mons. A. Collart of the Musée Royale, Brussels, for allowing me to examine Wesmael's type. It has 22 antennal segments and is like one of the palest Silwood specimens. The disk of the scutellum, much of the first gastral segment, and the sides of the propodeum (largely) are orange. The ovipositor seems to be a little shorter and more curved than in British specimens but this may not be significant. A similar variation has been seen in *P. sicheli*. The female from the Ruthe Coll. stood under the right name in the British Museum collection.

Beating broom at Silwood Park also produced one female (17.vi.58) which is very close to *P. dubius* but appears to be different. In this female the sides of the prothorax and mesothorax are partly black-marked; the anterior stalk of the first gastral tergite pale yellow; the size a little larger; antennae with 26 segments; depression at apex of scutellum narrower and more transverse but deeper; part of costa beyond pterostigma much longer than adjacent posterior side of latter; first gastral tergite longer and more gradually widened; ovipositor longer. The only likely Chrysomelid host for this species was *Galeruca tanaceti* (L.), which is the only other Chrysomelid common in the locality; but we have not yet reared any parasites from that beetle.

2. *Perilitus sicheli* Giard

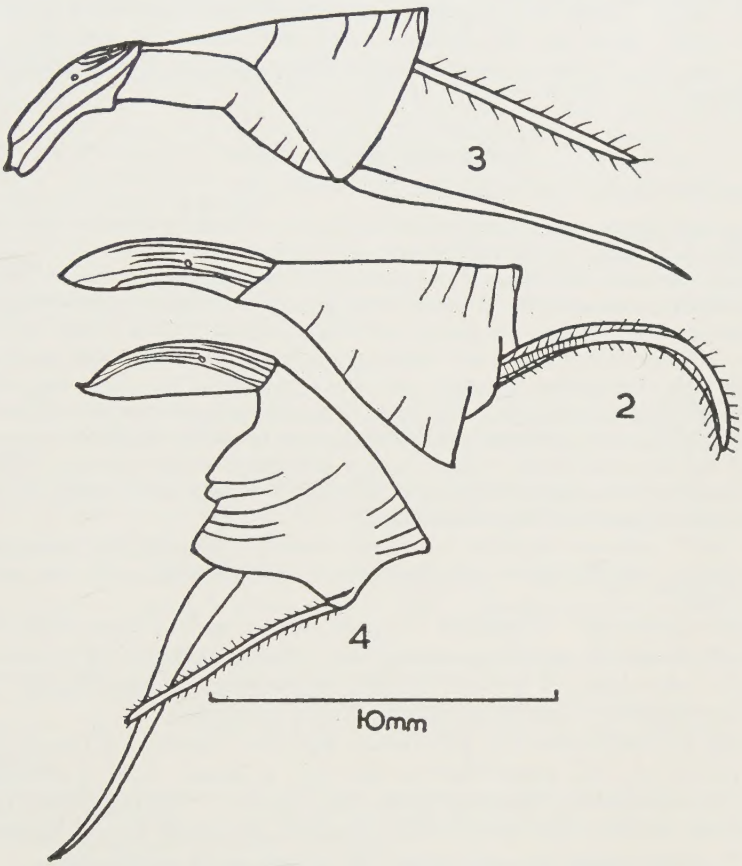
Perilitis sicheli Giard, 1895, *Ann. Soc. ent. Fr.* (*Bull.*) **64**: lxxvi, ♂♀.

Female.—Black; lower part of head and mouthparts, gaster after first segment, piceous; coxae more or less piceous, rest of legs testaceous. Wings hyaline, venation testaceous. Length of body 2·6–2·8 mm.; length of fore wing 2·7–2·8 mm.

Structurally resembles *P. dubius* (Wesm.) except in the following particulars: face rather more shining, especially at sides; antennae with 22–24 segments, fourth segment five times as

long as broad ; hypostomal keel weaker, not at all projecting over the mandibles. Mesoscutal furrows rather stronger, disk punctured rather than granulate ; scutellum posteriorly with a small but moderately deep depression of which the posterior margin projects as a small lip. Fore wing with part of costa beyond pterostigma variable in length, longer than adjacent posterior margin of pterostigma in French specimens, shorter in S. Devon specimens. Gaster with parallel-sided part of petiole shorter, the sides soon beginning to diverge, posterior margin of first segment nearly twice as wide as hind coxa, segment longer than first three segments of hind tarsi, surface regularly striate, striae extending to near the proximal end ; ovipositor (fig. 4) similar but a little more curved downwards.

Male.—Colour and size as in the female ; structurally similar with 23–27 segments (26–27 in French, 23–26 in British specimens), segment 4 about four times as long as broad.



Figs. 2–4.—Gaster, from left side, ♀ : (2) *P. falciger* (Ruthe) ; (3) *P. dubius* (Wesm.) ; (4) *P. sicheli* Giard.

England : S. Devon, near Kingsbridge, ex *Timarcha laevigata* Fab. (= *tenebricosa* Fab.), em. 22.v.29, 4 ♀ (*K. G. Blair*) ; S. Somerset, Rowberrow, ex *Timarcha tenebricosa* Fab., ♀, la. emerged 25.vii.48, 7 ♂, adults, viii.48 (*A. M. Easton*) ; Cambridge, Fleam Dyke, 22.viii.20, ♂ (*G. T. Lyle*) ; British Isles, 1904–120, ♂ (Marshall Coll.). France : Brittany, vii.1913, ex *Timarcha tenebricosa* Fab., found alive, ♀, 15 ♂ (*Miss G. M. Shepherd*). (All in Brit. Mus. (Nat. Hist.).) N. Devon : Mortehoe, ex *T. tenebricosa* ♀, 2.vii., em. viii.59, 2 ♂, 1 ♀ + larvae which died (*G. E. Woodroffe*) ; Merioneth : Cader Idris, Llyn Cae, ex ♀ *Timarcha tenebricosa*, 16.v, parasite larvae emerged 22.vi, ♀ adult 7.vii.59 (+ 22 cocoons and about 15 larvae) (*O. W. R.*).

Sichel (1854, *Ann. Soc. ent. Fr.* (3) **2** (*Bull*) : 57) exhibited Braconids bred by Chevrolat in France from *Timarcha tenebricosa* F. The parasites were not identified but were said to belong to two species. Giard (1895, *l.c.*) records that several lots of about 50 *P. sicheli* were bred by M. A. Binet from the same host at St. Valery-en-Caux ; he suggests that Sichel's record was based on the two sexes of the same species.

British records have always been recorded as *P. falciger* Ruthe but probably they really all concern the same species. The principal records are those of Marshall (*l.c.*, 1896 : 42, 57–58), of Bignell (1891, *Ent. mon. Mag.* **27** : 169, Cornwall) and Easton (1949, *Ent. mon. Mag.* **85** : 30, N. Somerset). There are also records of *Euphorus pallipes* (Curt.) by Donisthorpe (1911, in Elliott and Morley, *Trans. ent. Soc. Lond.* **1911** : 471–472) and of *Sigalphus luteipes* Thoms. by Patterson (1931, *Proc. zool. Soc. Lond.* **1931** : 938). These last two records require confirmation before acceptance.

Jolivet (1947, *Misc. ent.* **43** : 33–35 ; 1950, *Bull. Inst. Sci. nat. Belg.* **26** : 7–8) also gives some records, but in most cases the determination of the parasites is somewhat uncertain.

3. *Perilitus falciger* (Ruthe)

Microctonus falciger Ruthe, 1856, *Stettin. ent. Ztg.* **17** : 300, ♂♀.

Female.—Dark brown, legs testaceous, coxae darker. Wings hyaline, venation testaceous. Length of body *c.* 2·5 mm. ; length of fore wing *c.* 2·7 mm.

Structurally resembles *P. dubius* (Wesm.) except in the following particulars : sides of face smooth and shining, antennae with 24–25 segments, segment 4 longer, about five times as long as broad ; hypostomal keel stronger and projecting beneath the mandibles as a small hyaline process. Mesoscutum with furrows stronger and deeper, granulations on disk hardly developed, small depression at apex of scutellum narrower, more like a transverse line. Fore wing with part of costa beyond pterostigma more distinctly longer than adjacent posterior side of latter. Gaster with petiole rather narrower, posterior part of first segment not wider than hind coxa, with surface bearing fine regular striae which extend further anteriorly, surface between them smooth ; ovipositor (fig. 2) less than half as long as gaster, not quite as long as hind tarsi, strongly curved (a basal part which is normally hidden is straight).

Male.—Black ; antennal segments 1–2 (darker dorsally), face, and legs testaceous ; coxae darker proximally ; centre of gaster somewhat brown ; length of body *c.* 2·8 mm., length of fore wing 2·5–2·8 mm.

Specimens examined : GERMANY : ♀ (here chosen as lectotype, B.M. 1859–101), labelled " *M. falciger* R. = ? *P. consuetor* Nees " (Ruthe Coll.), 1 ♀, 2 ♂ (one ♂ without gaster) with same data ; 1 ♀ " 11.vi.1856, *Microctonus falciger* Ruthe ", no other data but the specimen is mounted like the Ruthe specimens.

Described by Ruthe from 2 ♂, 2 ♀, Berlin, late June (*Ruthe*), 1 ♀ Danzig (*Brischke*). Marshall (1887, *l.c.* : 76) states that he has seen a female from Northamptonshire and that it is very distinct from the form of the terebra. This might well refer to the true *P. falciger* which is not yet certainly recorded as British, but as Marshall clearly included *P. sicheli* under the same name the record needs verification.

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